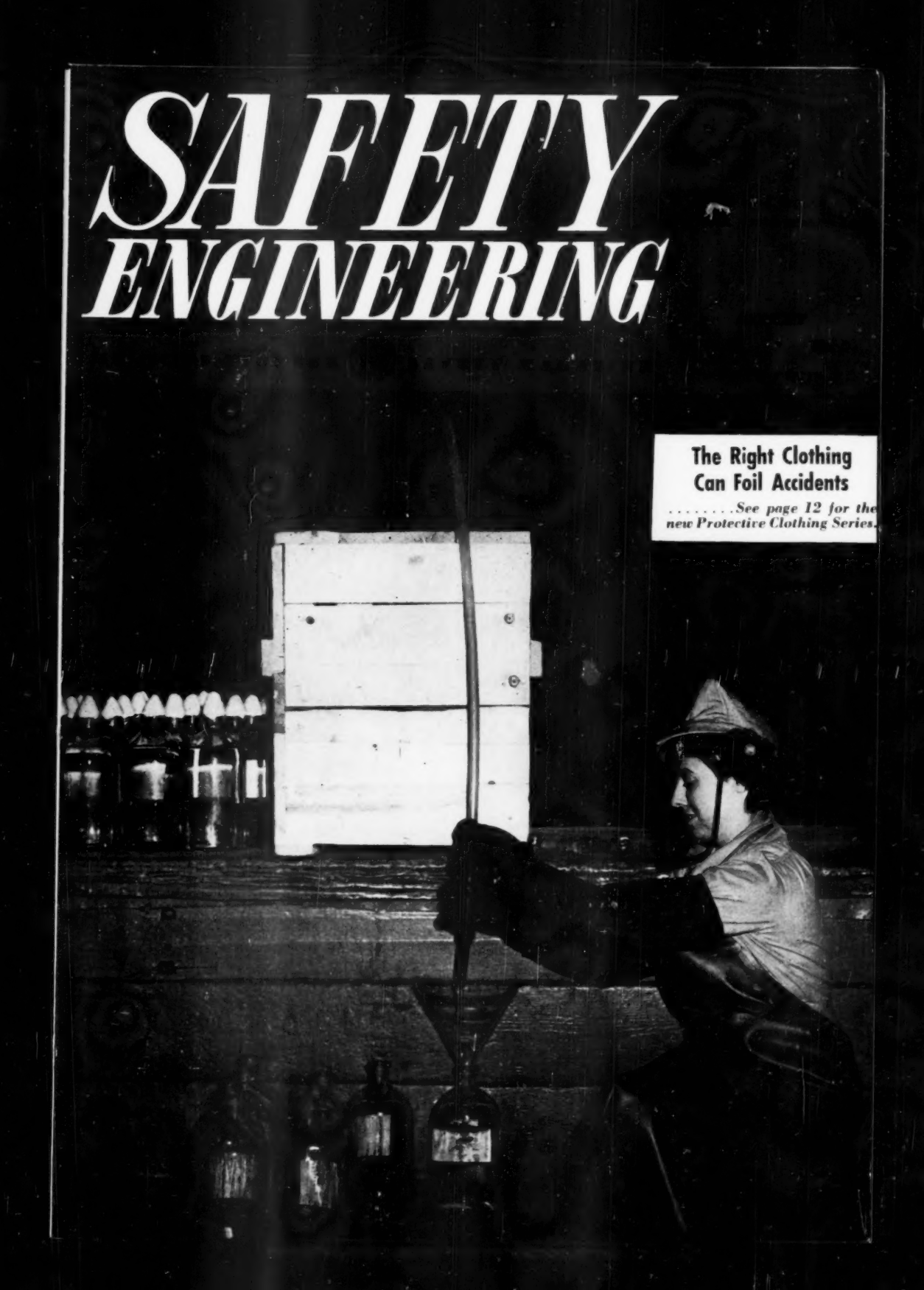
SAFETY ENGINEERING



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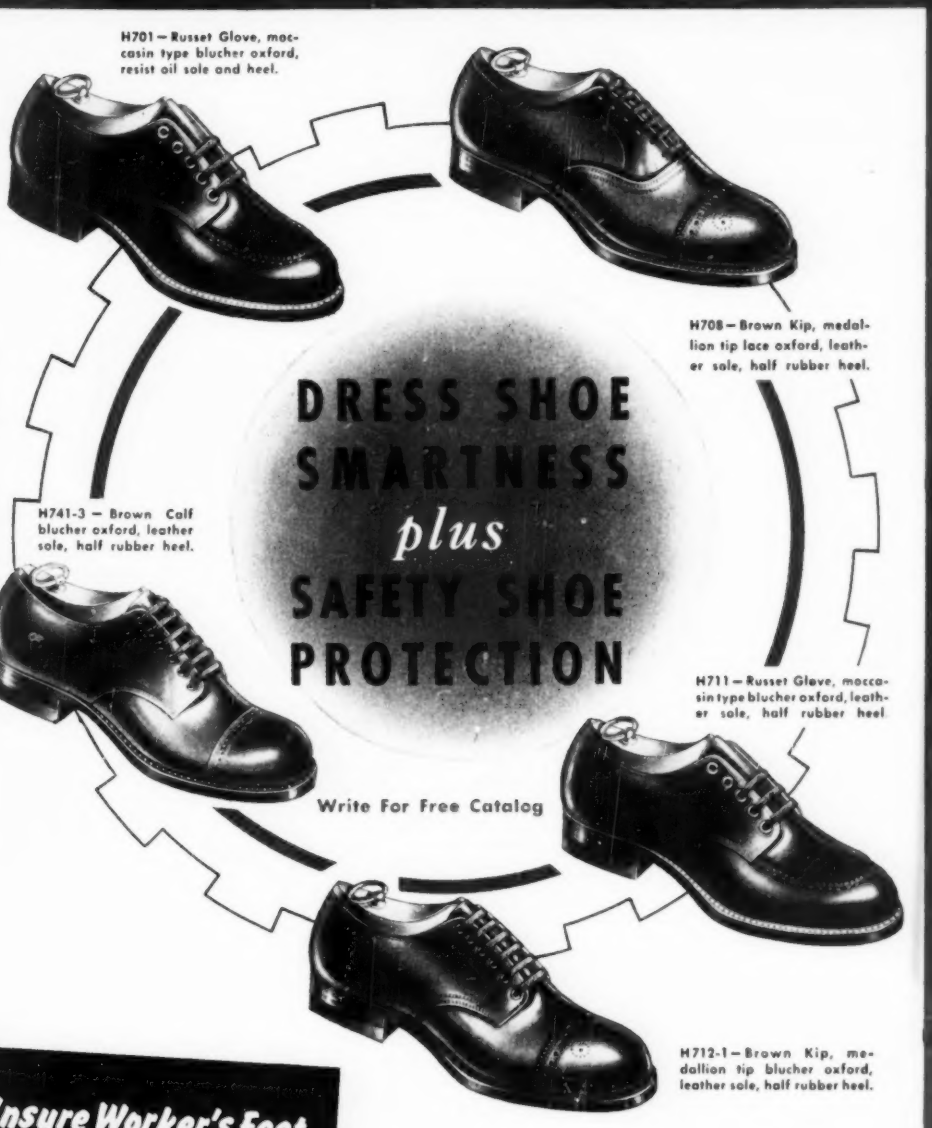
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Use of *Energy in Color* Improves Production of Bottle Caps, Seals and Filling Machinery, Says Crown Cork & Seal Company's Chief Engineer

THESE DAYS . . . the alert manufacturer considers carefully every development—no matter how new or unusual—which will help him to build more and better goods at lower cost.

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Reg. U. S. Pat. Off.

A MONTHLY PUBLICATION DEDICATED TO ACCIDENT PREVENTION, HEALTH CONSERVATION AND FIRE CONTROL.
EST. 1901

Vol. 98, No. 2 **BEST'S 50TH ANNIVERSARY YEAR**
AUGUST **1949**

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It's Safe to Say

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★ INTER-AMERICAN CONGRESS POSTPONED

WHEN sponsors of a safety conference give primary consideration to the aims and objectives of exhibitors, that fact comes under heading of news. Too often, the exhibitor—especially the smaller firm with little or no influence—is pushed around by arrogant officials with little minds and is told to pay up and shut up; that if he doesn't like any part of the arrangements, his space can be sold many times over.

At the time of organizing for the World's First Inter-American Safety Conference, the sponsoring organizations realized that the growth of the development for all time would rise or fall on the success of the first convention. Those behind the scenes recognized the vital role of the exhibitor as well as the session delegate and unusual facilities were placed at the disposal of those who would show their wares to Latin America.

After almost unprecedented interest had been aroused, it required great courage to announce an indefinite postponement of what had given great promise in the field of international safety.

With wisdom and rare consideration, the Inter-American Safety Council points out that few delegates would be able to attend from the South American countries because of the difficulties involved in obtaining dollars for expenses outside the boundaries of their own countries. Attendance therefore would be drawn mostly from Central America, Cuba and Mexico and of course would not be truly representative.

Exhibitors would be the chief victims of any such fiasco because of the limited attendance, and dollars would not be available for the purchase of products on display.

When currency restrictions can be relaxed and conditions become favorable, the sponsors promise a safety conference that will make history in the entire Western Hemisphere.

SAFETY ENGINEERING offers sincere congratulations to the Inter-American Safety Council for a most difficult decision arrived at without any thought of self. It would have been simple, perhaps, to proceed with original plans especially in view of the great interest aroused and hold the convention according to schedule. Then the natural disappointment and even resentment of exhibitors could have been countered with "excuse it please, so sorry!" Instead, the sponsors know full well that the more unselfish course will pay far greater dividends in the future. Our sympathies go out to those who planned to visit Havana this fall and to those frustrated delegates, we now say slip away and visit our sister Republic of Cuba anyway.

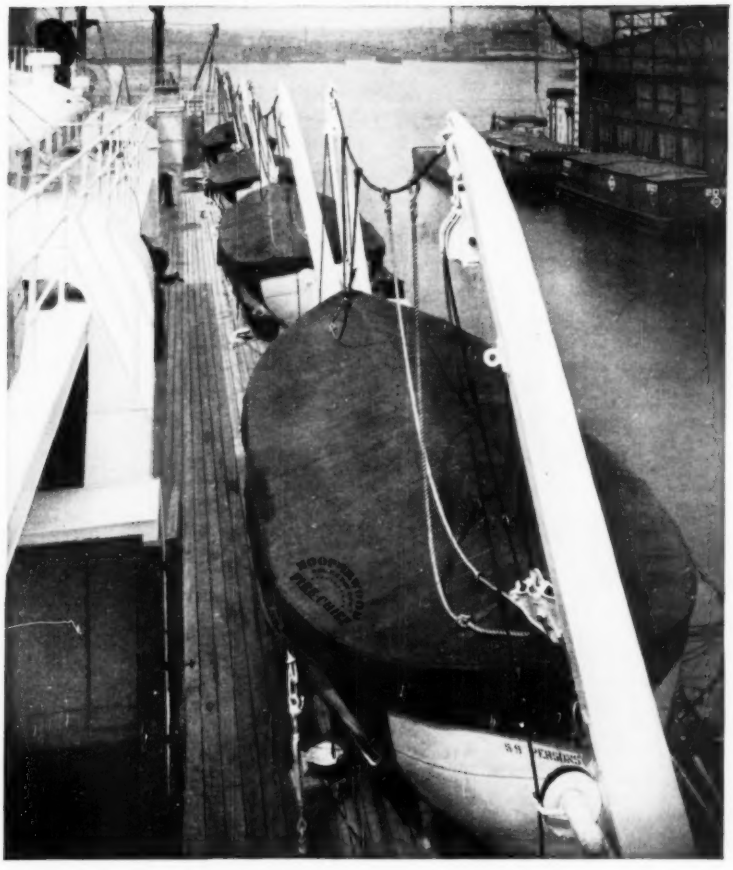
Perhaps changes in rules governing international commerce will make possible a Spanish-accented safety conference in 1950. If so, Cuba will be lavish in its hospitality.

★ PLANT HYGIENE

FAR too many industrial plants have no plan of action to advance the cause of hygiene and thus contribute to employee health.

It would be interesting to have details of any systematic campaigns with special emphasis on dermatitis prevention and control. We shall be glad to receive data on the subject from which a survey can be prepared for the benefit of other employers, and readers are invited to make this cross-sectional survey possible. We will omit all company names, of course. H.A.

Life Savers for Life Boats



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SAFETY ENGINEERING
VOL. 98, NO. 2 • AUGUST, 1949

Block That Alibi!

By H. A. STONEHOUSE, President,
Stonehouse Signs, Inc., Denver, Colorado

Accident prevention signs will help block those accident alibis by preventing the accident itself.

ANYONE who has ever investigated an accident is familiar with such alibis as: "I didn't see it.", "I didn't hear it.", or "I didn't know it." In fact, such statements as these have been made so often that they are easily discounted as picturing the real accident cause. The tendency today is to look for a deeper psychological cause behind the simple alibi, and this probing of underlying mental and emotional disturbances reveals the factors which can block a person's alertness temporarily and leave him accident prone.

However stimulating the psychological approach to industrial accidents may be, the old-fashioned alibis should not be completely overlooked in accident investigation. It doesn't matter whether a person is blind with rage or blind with worry, he still is momentarily blind to the hazard, and his statement that he "didn't see it" may be literally true.

It should also be kept in mind that not all accidents are merely the result of emotional disturbances, no matter how temporary. Other factors are improper guarding of the machine and of the person, failure to replace guards or indicate a hazard, inadequate knowledge of the hazards involved, failure of mechanical parts. In short, the prevention of industrial accidents is essentially a question of keeping the employee always alert, of making him see and understand the dangers.

Even in "psychological" accidents, the real problem is one of keeping the employee alert in spite of an emotional disturbance. He should be made to "see" the hazard in spite of himself. He should not be given the chance to say that he didn't see. He must not be allowed to forget that the machine must be stopped before an adjustment can be made, that he must wear safety goggles or a respirator on a certain job, that he is not technically qualified to enter a certain area safely.

To block those accident alibis, to double check the employee's safety training, to keep him alert all the time, to keep him out of the hospital bed and on the job—to accomplish these things is the reason for having accident prevention signs.

What Kind of Signs?

Signs are one of the oldest means of conveying warnings against sources of accidents and hazards. The early-day crude "homemaders" were the forerunners of today's modern accident prevention signs; and today these signs are designed and produced by specialists in this particular field of industrial safety service.

"Homemaders" are likely to be inadequate for the purpose. They may use ineffective colors; they may confuse rather than warn or define; they may emphasize the wrong things.

There are now standard accident prevention sign designs and colors, established by American Standards Association "Specifications for Industrial Accident Prevention Signs, Z35.1, 1941."

These standard specifications assure uniformity, so that such signs promote hazard identification wherever they may be seen. They eliminate the confusion caused by the numerous old varieties of designs and colors, and bring helpful, established order to the use of accident prevention signs.

It is important to remember that, legally, to stand up in court in the

---

FEATURE

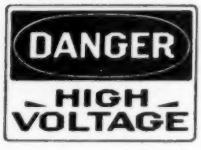
This is the second of a consecutive series of three major articles dealing with Educational Aids to Safety. The third feature of the series will appear in the September issue of SAFETY ENGINEERING.

event of a suit due to an industrial accident, an accident prevention sign should state what the danger or hazard is and how to avoid it.

The word "Danger," "Caution," or other word of warning alone is not enough. The sign wording below the panel should be as specific as possible in telling what the hazard or danger is and how to guard against it. Otherwise it is not a "true" or authentic accident prevention sign.

The main classifications of authenic Accident Prevention signs are:

Danger Signs



To warn of specific dangers only. The word "Danger" shall appear in white letters on a red oval inside a black rectangular panel. The sign wording should be in black letters on the white background.

Caution Signs

To warn of possible hazards, dangers or unsafe practices. Caution signs shall have a yellow background. The word "Caution" shall appear in yellow letters on a black rectangular panel. The sign wording should be in black letters on the yellow background.

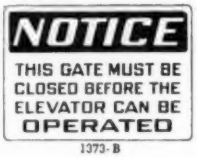
Think Signs

To provide information relating to general safe practices. Safety instruction signs of this type should have a white background. If words such as "Think" or "Be Careful" are used, they should be in white letters on a green rectangular panel. The sign wording should be in black letters on the white background.

Directional (Arrow) Signs

To indicate the way to fire escapes, exits, stairways and other locations. Directional signs should have a white background. The arrow pointing out the direction should be in white on a black rectangular panel. Any wording in or below the panel should be in black letters on the white background.

Notice Signs



Informational. To carry messages of a general nature, such as rules, regulations, and markers, when such postings do not conflict with Danger or Caution purposes. May be in any of a variety of designs and colors except that neither red nor yellow shall be used. Color preference: the word "Notice" in white letters on a blue rectangular panel.

With the designs and colors specified by American Standards Association, any message may be put on a sign. Many such messages are classed as "stock wordings," in wide use, and cover most general requirements. They include such messages as apply to Explosives, the Use of Respirators, High Voltage, Wear Goggles, No Smoking and many others. Special wordings, to meet particular or unusual hazards, are also produced.

Using standard type signs and appropriate wordings enable industry to standardize its accident prevention signs most effectively, and it is always best to use such signs made in accordance with American Standards Association specifications.

Signs are generally made of metal, with such finishes as baked varnish, baked flexible enamel and porcelain enamel to give long service.

Danger Tags

Large danger tags, 4 x 7½ inches, carrying the standard "Danger" sign design and colors, are useful to provide temporary warning by tying to objects such as machinery, switches, valves, etc., which may be out of order, and present a hazard.

These danger tags are available made from a special tough, heavy stock, to resist wear, water, etc. They can be easily written on with pen, pencil or crayon, and are fitted with long, strong cords for tying. There are many stock-worded tags, covering most general needs. Specially worded tags can also be furnished on order.

Thus every danger spot and hazard can and should be covered by the proper accident prevention sign—or temporarily, by tying on a danger tag to serve while waiting for the proper permanent sign. Long experience by industry has proved that the use of the right signs and tags is a powerful aid in safeguarding workers and in helping to prevent accidental injuries and deaths. Accident alibis can be blocked by keeping employees on the alert.

Drawings by courtesy of Stackhouse Signs, Inc.

A long-distance photoelectric relay installed for anti-sabotage protection. The device supplies "chopped light" and utilizes infra-red filters, so that the equipment cannot be "jammed" by intruders. The instruments can be located along fences or buildings and combined with a central alarm.

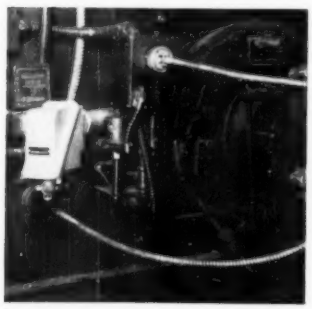
Electric Eyes See the Dangers

By ERNEST JELLINEK,
Electronics & Regulator Control Engineering Div., General Electric Company

How you can use photoelectric relays for flame failure detection, smoke density indicators, and for general plant protection.

MANY duties in and around power plants can be performed effectively and safely by photoelectric relays of the proper type. Photoelectric relays are switches that are opened or closed by light, which is provided in the form of a beam or directly from the source, such as a flame or the sky. The switch may be connected in any electrical circuit for control or signal purposes.

Heart of the photoelectric relay is the "eye" or phototube, which contains a cathode and an anode. The cathode is a semi-cylinder, and when illuminated the inside surface emits electrons. A wire anode when properly connected collects and conducts the electrons out of the tube. Microampere current, approximately proportional to the light intensity, is amplified by one or two stages of vacuum tube amplifiers to a level sufficient to operate a small magnetic relay. Photoelectric relays combine the phototube, amplifier, and magnetic relay into one device that is functionally a light-operated switch.



Flame detector, left, is mounted a few inches from boiler as protection against flame failure.

Smoke density indicator mounted on breeching of stack can actuate alarms or recording devices.

Flame Detection

Application of the photoelectric relay is becoming more common as flame detectors for oil furnaces. In case of flame interruption caused by momentary passage of impurities, the oil supply must be shut off by either closing the oil valve or stopping the pump. Otherwise, a quantity of oil would be pumped into the combustion chamber and might result in an explosion at the next ignition cycle. Detection of flame failure has been performed for many years by the stack switch which contains a thermostatic element mounted in the flue passage. The element is sensitive to flue gas heat and opens the circuit to the oil valve or pump when temperture decreases. A clutch arrangement operates auxiliaries on a definite change in temperature rather than at a particular temperature. Even so, an appreciable time lag occurs before a flame interruption is felt in terms of a drop in flue gas temperature. On large burners, where the firing *(To page 44)*

NEW DEVELOPMENTS

By D. M. RALEIGH,

Manager of Special Industrial Merchandise,

The B. F. Goodrich Company, Akron, Ohio

How do the new synthetic rubber and plastic materials compare with natural rubber for protective clothing purposes? What changes are being made in rubber gloves and footwear?

INDUSTRIAL protective clothing is becoming increasingly specialized. Safety engineers and management may think that because the protective clothing used twenty or even ten years has seemed to be adequate, there is really no need to investigate new types. Fortunately, such un-inquiring minds are in a minority. Progressive companies are discovering that the old has been greatly improved and that the new is sometimes superior. They are finding out that the new specialized clothing gives the workers greater security, that individual efficiency is thereby increased, and that both production and accident costs are lowered.

The rapid growth of specialized industrial protective clothing has been an amazing phenomenon in the rubber industry during the postwar years. The development of new lines in this field has been nearly as important as the creation of American-made rubber and the puncture-sealing tubeless tire, though less spectacular than those developments. It is, in fact, related to the former, in that fabricators of industrial protective clothing attribute their present strong position to the production of new and better synthetic rubber during the past five years. Whereas natural rubber was used exclusively in this branch of the business before World War II, it has been replaced almost completely by man-made rubber and vinyl resins especially compounded for excellent resistance to greases, oils, acids and abrasion. Today, one of the leading rubber fabricators relies 100 per cent on man-made rubbers and vinyl resins for its industrial garments, gloves and footwear.

Protective clothing coated with light and flexible materials is used in many industries to protect employees against acids, alkalis, greases and oils, and dermatitis. In addition to this all-round protection, meat and fish packers find that the use of rubber and plastic aprons also results in a sizable saving in laundry bills in many cases. For example, the clothing of meat and fish packers can be sterilized with steam or washed down with a pressure hose each time they are worn.

Many types of protective clothing are produced and each has its specific use. For example, a well-known line of protective suits and aprons has been especially useful in the meat packing and allied oleomargarine, tallow and grease, shortening, glue, vegetable and mineral oil industries. This American-made material offers great resistance to animal and butter fats.

Nevertheless, considerable confusion exists in the minds of the public as to the differences between rubber and rubber-coated and plastic protective clothing. In gen-

FEATURE

This is the first of three feature articles concerned with Protective Clothing. The next two articles of the series will be published in the September and October issues of SAFETY ENGINEERING.

IN LIQUID-PROOF PROTECTIVE CLOTHING

eral, fabric-based rubber and plastic clothing is more serviceable. To aid industrial clothing buyers in selecting the most suitable garments for employees, Table I offers technical information on GR-S (American-made rubber), Natural Rubber and Vinyl Resins and their qualities.

Body Protection

In recent years the lines of protective clothing for the body have been expanded considerably, and they now include everything needed by workmen for complete, comfortable protection—from featherweight film aprons and heavier work suits to the heavy duty general-purpose work coat and all purpose work suits.

Today, seams are often cemented, strapped and rolled, then cured and vulcanized, forming a seal that is extra-strong and leakproof.

The rubbers used in protective clothing have been specially developed for resistance to abrasion and are tempered with age-resistant compounds to remain pliable and last longer. In fact, the texture actually improves with age by wearing to a smooth, leather-like finish. In addition, this rubber has exceptional resistance to oil and grease. It is inseparably bonded by tons of pressure to closely woven frictioned drill and will not peal or crack.

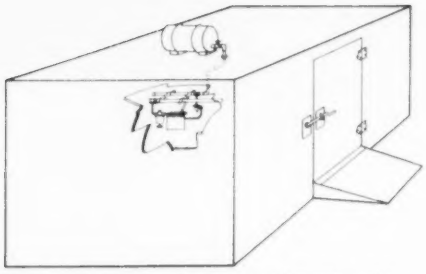
A complete line of clothing has been developed from a flexible plastic material which offers greater resistance to abrasion than sole leather and will not scratch or scuff up. It is impervious to most acids, greaseproof, waterproof, oilproof, even dirtproof, since it washes almost *(To page 58)*

Table I.

MATERIALS		
GR-S	Natural Rubber	Vinyl Resins
COMPOSITION		
Synthetic Rubber. A copolymer of butadiene (75%) and styrene (25%). Butadiene and styrene are obtained from refinery gases.	Isoprene polymer, polymerized by nature and obtained as a latex.	Vinyl chloride polymer. Vinyl chloride polymer is hard and brittle and must be plasticized to be used for cloth coating for wearing apparel.
PROPERTIES		
Can be vulcanized with sulfur and accelerators.	Can be vulcanized with sulfur and rubber accelerators.	Not vulcanized.
Flexibility is good at room and lower temperatures.	Flexibility is excellent at room and low temperatures.	Flexibility is good at room temperatures but stiffens at lower temperatures.
Flammable	Flammable	Can be made nonflammable.
Abrasion resistance of compounds for cloth coating is better than natural rubber.	Abrasion resistance is good.	Coating compounds are tougher and more resistant to abrasion than GR-S.
Oil resistance is poor.	Oil resistance is poor.	Can be compounded for good oil resistance.
Dilute acid and alkali-resistance is good.	Dilute acid and alkali-resistance is good.	Dilute acid and alkali-resistance is excellent.
		Fabrics can be coated one half as light as GR-S or natural rubber and still maintain good qualities in aging and resistance to chemicals.
High-temperature service is better than natural rubber.		High-temperature service is better than GR-S or natural rubber.
Resistance to atmospheric deterioration is higher than natural rubber.		Resistance to atmospheric deterioration is very good—better than GR-S or natural rubber.

How To

By H. RICHARD RICH,



Fumigant atomizing system changes the special liquid insecticide into a heavy, insect-killing dry gas. For permanent installation in vaults where furs, foodstuffs, furniture, etc. are stored.

United States industry suffers a loss of well over $1,000,000,000 a year due to insect pests.

For several hundred million years roaches have been upon the surface of the earth.

One fly can carry more than enough typhoid germs to give one germ to each person in New York State.

The offspring of one female house-fly could, in one season, fill 1,250,000 Empire State Buildings . . . provided all the eggs hatched and all the offspring survived.

There are 80,000 kinds of insects in the United States alone. All the Plant Manager has to concern himself with are some 15–20 of these 80,000.

THE above are cold facts, not idle thoughts. In spite of them, management often does not take its insect problem seriously. The "hush-hush" policy of not discussing insect problems existing in plants has been responsible for the lack of progress made in the reduction and control of insect infestation.

Every industry can readily state a figure which represents the cost of insect infestation in its plant. It is comparatively simple to itemize the number of cartons and labels damaged, the amount of finished product contaminated, and the storage losses due to infestation . . . but, often the more intangible losses suffered because of decreased production, loss of morale, absenteeism, and the general nuisance value of insects within plants, are ignored.

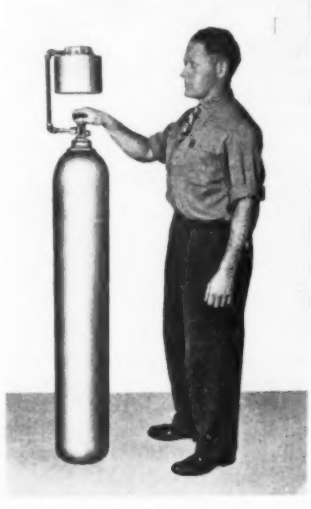
For many years, however, some of us have been aware of the tremendous need for a scientific method of ridding industry of the insect problem and for doing something practical about it. Many trips to industrial plants and many years of research were utilized in the preparation of a single method to not only combat, but definitely control the rapidly reproductive insect problems in the nation's industrial operations. We fully realized that although insecticides had been constantly improved, so that today insecticide formulas are available which offer a high killing power, the method of application of these insecticides has lagged behind the progress made in insecticide development.

The most practical, efficient and effective method of destroying the insect pests within a plant would be to diffuse liquid insecticide into a dense fog throughout the entire plant at the same time.

Industrial Atomizer Systems

Such a method or system has been developed. It utilizes atomizing equipment and is a modern and effective method of insect control for industrial plants.

The atomizer has ten atomizing nozzles which dispense insecticides to all parts of the room in which it is installed. The lower portion of the atomizer holds insecticide at all times to accomplish instantaneous atomization from syphon tubes immersed inside a reservoir. The atomizer is constantly supplied with insecticide without involving the operation of an extra valve. This feature is made possible by an automatic copper float inside the reservoir. This float, or gravity flow equalizer, is built entirely of Monel metal, brass and copper,



Carbon dioxide gas may be used as the propellant for plants not equipped with air or steam pressure. The 2-quart container will provide insecticide fog for areas up to 30,000 cubic ft.

FEATURE

This is the third of a series of five major articles on Plant & Building Maintenance. The next two articles of the series will appear in the September and October issues of SAFETY ENGINEERING.

Control Industrial Insects

Chief Entomologist, West Disinfecting Company, Long Island City, N. Y.

with all parts nickel plated to ward off corrosion. The equalizer is built to withstand 90 pounds gravity head pressure from above.

To meet the needs of every type of industrial plant, five types of atomizers are available: (1) Standard Atomizer—operating with compressed air; (2) Steam Atomizer—operating with steam; (3) Fumigant Atomizer—operating with compressed air for a liquefied gas fumigant; (4) Portable Atomizer—operating with compressed air; (5) CO_2 Atomizer—operating with Carbon Dioxide Gas.

The atomizer disseminates a "dry" mist of insect-killing droplets about 8 microns in diameter. For this reason, no condensation is noticeable. The atomizer will release insecticide mists in particle sizes so small they will not wet or condense on tables, walls or any equipment with which they may come in contact, provided the atomizer is in operation the correct, easily regulated length of time.

The ten atomizing nozzles dispense the insecticide into the upper, as well as the lower strata of a room, thoroughly penetrating the cracks and crevices where insects hide and breed.

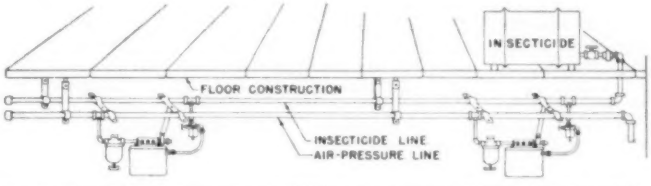
Such atomizing equipment is tailored to fit every type plant and to provide the most modern and effective method of insect control, yet it reduces the amount of labor involved in this task to just one man and reduces the time to less than 20 minutes for the entire plant! The apparatus also achieves maximum performance from the insecticide, thus reducing the cost of insecticide per area treated.

Portable Units

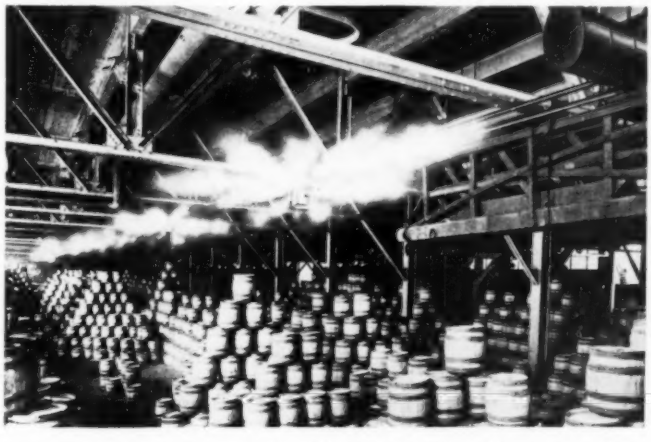
Should it be determined impractical to install an atomizer system, a new portable *(To page 48)*

Steam atomizing system for areas serviced by steam pressure. Operator is using special wrench to open waste cock to blow out condensation and impurities before atomizer equipment is used.

Portable atomizing equipment is operated by compressed air. Container and atomizing equipment are mounted on portable stand for desired placement. For areas up to 30,000 cubic feet.



One atomizing unit should be used for each 100,000 cubic feet of space. Diagram shows arrangement.



Standard atomizing system which diffuses insecticide fog through 800,000 cubic feet in ten minutes.

$NaCN \cdot C_6H_5NO_2 \cdot POCl_3 \cdot CH_3 \cdot C_{10}H_7NH_2 \cdot PCl_3 \cdot$

GUIDES TO

By D. O. MASON, Chairman, General Safety Committee, Manufacturing Chemists' Association, Inc., Washington, D. C.

The work of the Manufacturing Chemists' Association is furthering the cause of safety in the transportation and handling of hazardous chemicals.

THE Manufacturing Chemists' Association, founded in 1872, through the years has ranked high among its activities the safe packaging, safe transportation and safe handling of the products of its member firms.

As early as 1875 the Association began work on the problem of establishing standard strengths of Sulfuric Acid for the use of both manufacturers and consumers, and in 1881–1882, an Association Committee prepared tables which gave the strength of Sulfuric Acid for different specific gravities and degrees Baumé at different temperatures. These tables remained standards until 1904, when the Association prepared standard tables for Sulfuric Acid, Hydrochloric Acid, Nitric Acid and Aqua Ammonia. These latter tables, accepted generally as standards by the chemical producing and consuming industries, are still in almost universal use today.

In 1895 the Association began work in the direction of establishing standard measures in American industry. Prior to that time, liquid measures based on the imperial gallon had been almost universally used in this country, and it was this work on the part of M.C.A. that led to the adoption of United States standard measures by American industry. In 1922 the Association published its standard specifications for laboratory apparatus, graduates, and thermometers which were received with marked favor by scientists not only in this country but abroad. In 1936 this activity was taken over and continued by the American Chemical Society.

Immediately following the first World War, the Association started to form various Technical Committees to handle other phases of its activities. The first Committee, formed in 1919, was the Carboy Committee, which is still active. Since that date many additional Technical Committees have been added. I quote in part from Association records "the great majority of this country's chemical packaging developments has originated in the Committees, and the Regulations of the Interstate Commerce Commission governing the transportation of dangerous articles constitute in a large measure a recording of Committee accomplishments and recommendations."

Through the various Committees, chemical tables, bulletins, tank car manuals, and other information have been published and made available to member firms and the general public.

Tank Car Manuals

The Tank Car manuals are known throughout the industry as the TC Series. The first of these, TC-1, covers the Unloading of Steel Tank Cars when Filled with Sulfuric Acid and Mixed Nitric and Sulfuric Acids. Item #1 of this manual covers "Safety Rules to be observed by employees assigned to unloading." The second paragraph covers explosions. The next paragraph has the title of "Bursting." A review of this manual from beginning to end reveals that its principal object is to provide a safe means of unloading Sulfuric Acid or the Nitric-Sulfuric Acid

$C_2 \cdot H_2SO_4 \cdot P_2O_5 \cdot HF \cdot CH_3OH$

THE HANDLING OF CHEMICALS

combination known as Mixed Acids. During the second World War this manual served as a valuable and useful publication for the safe handling and unloading of hundreds of thousands of carloads of strong Sulfuric Acid, Oleum and Mixed Acids. Its guidance for many concerns and individuals previously entirely unfamiliar with recommended practice served to complete an enviable record for the shipment of a vast movement of highly concentrated and reactive chemicals. This stands as a credit to the authors and Committee who prepared the manual and to the Association members who saw to it that it was widely distributed. Other manuals include:

TC-2 Handling of Muriatic Acid or other liquids authorized for shipment in rubber lined tank cars.

TC-3 Unloading of Steel Cars filled with liquid Caustic or Caustic Potash.

TC-4 Unloading of Flammable Liquids. The general arrangement shown in Figure 2 of this manual was developed by the efforts of the Static Electricity Committee of the National Fire Protection Association, was adopted as a standard and promulgated by the M.C.A., and is extensively used throughout the flammable products industry. M.C.A., therefore, has cooperated with many reliable organizations in an effort to safely transport hazardous material.

TC-5 Now discontinued. Covered the unloading of Hydrofluoric Acid. This information is now consolidated under an H-10 Manual covering "Handling and Discharging Containers of Hydrofluoric Acid, Aqueous and Anhydrous."

TC-6 Unloading of Phenol.

Labeling Information

Taking a broad view, the publications of the Association have in the main been directed to Safety. It is logical, therefore, that during the latter part of the second World War, with the ever-expanding chemical industry, the Executive Committee of Manufacturing Chemists' Association formed a Committee known as the Labels and Precautionary Information Committee. This Committee *(To page 40)*

TABLE I.

Chemical Safety Data Sheets

I. *Name*
- **a. Chemical name of product**
- **b. Common name or names**
- **c. Formula**

II. *Properties*
- **a. Grades and strengths usually shipped**
- **b. Important physical and chemical properties as they apply, from a safety standpoint, and such tables as would be of advantage to the user of the various products in safely handling the same.**

III. *Usual Shipping Containers.* Including type, size, label identification and disposal and return precautions applicable to the product being covered. Where ICC regulations apply this is covered in detail.

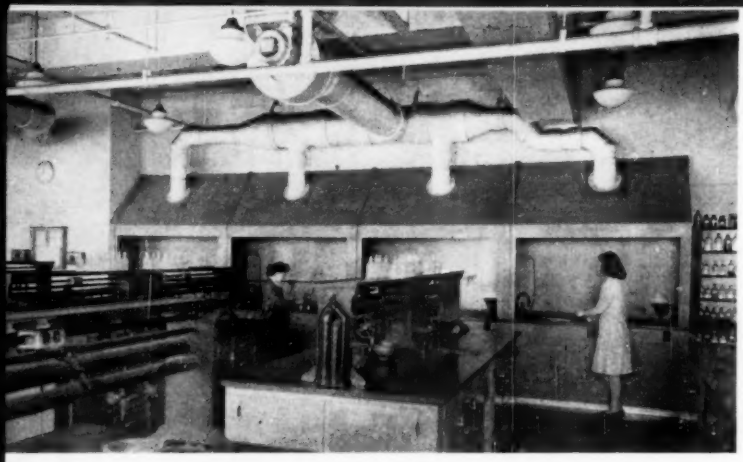
IV. *Unloading and Emptying Containers.* This heading to cover necessary and recommended precautions applicable to the usual shipping containers.

V. *Storage.* Gives a guide to established practices regarding type of storage, isolation, ventilation and general protection of the product prior to its use or distribution.

VI. *Handling.* This section covers handling of spills and leakage, employee education and training, personal protective equipment, engineering controls, ventilation, equipment, tank, storage cleaning and repairs; repackaging and other pertinent subjects, such as: brief description of health hazards, fire and explosion hazards, arrangement of safety showers, washing facilities and other safety precautions applicable to handling.

VII. *Waste Disposal.* Here only brief precautions are presented as this subject is so involved that to endeavor to cover it completely is far beyond the scope of the General Safety Committee. It should be of interest for you to know that the Association has a Technical Committee devoting its activities to this important subject.

VIII. *Health Hazards and Their Control.* This Section, prepared by the Medical Advisory Committee, covers its recommendations regarding the Health Hazards and Their Control and recommended First Aid and Medical treatment.



Fume exhaust system installed in chemistry laboratory.

HOW

By WALTER E. LANGLOIS,

FUMES—deadly, explosive, toxic or nauseating constitute one of the most serious problems facing modern industry. The problem, although difficult to the man in the street, can be handled readily enough by air systems if an understanding of the basic fundamentals can be acquired.

The proper design of hoods is of the utmost importance. The design is complicated by the fact that conditions vary extensively, ranging from nearly complete enclosure of the source of fume generation, to the need for an exhaust hood with sufficient clearance to avoid interference with the manufacturing process. Hoods should be placed as close as possible to the source of the fumes, as the effectiveness decreases rapidly when the entrance of the hood is moved away from the source.

When the flow of air into a hood is unobstructed, the following formula is useful in determining the air velocity at any point along the axis of the hood.

$$V = \frac{0.1Q}{b^2 + 0.1A}$$

where:

V = Velocity in feet per minute
Q = Volume of air handled in cubic feet per minute
b = Distance along axis in feet
A = Area of hood in square feet.

It is quite evident that the zone of influence of an exhaust hood is narrowly restricted to the immediate region of the face of the hood, and consequently exhaust hoods must be placed close to the source of the material to be controlled, or must enclose the source, or must be placed so that the natural movement of the fumes is towards the hood mouth.

Flanges surrounding a hood opening reduce the air flow from the ineffective regions back of the hood, and thereby increase its effectiveness by forcing air to flow from the zone directly in front of the hood. The height of the flanges should preferably be one-third the depth of the hood, and under such conditions the air volume for a given velocity in the effective zone will only be about 75 percent of the air volume required by an unflanged hood.

Hood Types

Any gases that have a tendency to rise may be exhausted by a canopy type hood. This is the common sloping hood shown in Figure 1 and usually seen over steam kettles, forges and similar equipment. Normally a velocity of from 150 to 200 feet per minute will be sufficient across the hood face. The connections to the top of the hoods are usually designed for velocities of 2000 to 3000 f.p.m.

Occasionally with this type of hood a condition will exist whereby some of the gas will escape around the edge. To prevent this, baffles or curtains are placed on the back and sides so that all air to be exhausted is drawn through the front.

Some installations will require a canopy hood of such length that a single riser pipe centrally located will not properly exhaust the gases at the ends. To avoid this, the riser pipe should be divided into two or more branches so that each branch will draw from a proportionate area. One difficulty may be encountered, in that the riser may exhaust only from the immediate area under it, and the extreme ends of the canopy may not function efficiently. This may be corrected by inserting baffles in the lowest part of the hood directly under the risers and causing the air to be drawn from the sides. The fumes directly under the baffle will flow toward the sides and be drawn into the riser from there along with the gases that ordinarily would not be moved without the baffle in place.

At times, when a canopy hood is employed, a tendency will exist for the fumes to curl around the edge of the hood. This can be avoided by building an inner hood into the hood as shown in Figure 2. This inner hood is fitted so as to form a slot about $\frac{3}{4}$" wide around the edge and also a central opening under the riser pipe. The high velocity through the slot at the rim of the hood forms an air curtain that tends to prevent vapors from curling outward.

Enclosed Hood

A common development of the canopy hood with sides and back sheet is the kitchen exhaust hood

TO CONTROL FUMES

Headquarters Staff Assistant, Sturtevant Div., Westinghouse Electric Corporation, Hyde Park, Mass.

How to select the proper hood for fume exhausting.
How to determine an efficient piping design.
How to choose the correct type of fan.

and the laboratory exhaust hood. In the construction of the kitchen exhaust hood, the exhaust openings should be provided with protecting baffles to reduce the entrance of grease. Once in the piping, grease is a constant fire hazard so that great care should be taken to arrange the baffles where the most grease can be trapped out. See Figure 3. Ductwork from kitchen exhaust hoods should lead as directly as possible to the outdoors, and should be well separated from all walls and partitions or well insulated with asbestos or similar materials.

Slotted Hood

In some processes, such as plating tanks, occasionally conditions over the tanks will not permit the use of overhead hoods. In such cases slotted hoods such as the one shown in Figure 4, can be used at the back of the tank.

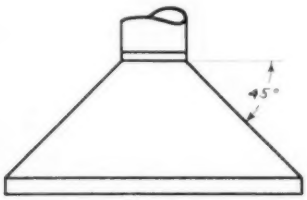
The volume of air with this type of hood should be based on a minimum of 150 CFM per square foot of tank, the slot if possible, should extend around three sides of the tank. On tanks over 5 feet wide fumes are difficult to control with this arrangement. To overcome this difficulty, combination blow and exhaust hoods may be used. The air volume supplied by the pressure fan should be $\frac{1}{4}$ of the volume handled by the exhaust hood. The exhaust hood should remove at least 200 CFM per square foot of tank area.

Spray Booth

Booths for spray painting, metal spraying, foundry shakeouts and similar operations are arranged with one open end and exhaust connections at the opposite end. With this arrangement, all of the air entering the booth flows past the operator. Spray booths should have baffles or water curtain at the rear of the booths to reduce the entrance of spray material to ducts and fan. See Figure 5.

When the fumes are heavier than air, down draft hoods may be successfully employed. These are often placed below the floor with a grating so that the space above may be used as a work station. The hood design is such that a down draft hood could be considered an inverted canopy hood.

It may be necessary, before making the hoods, to construct test models of thin metal or cardboard



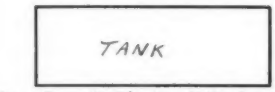
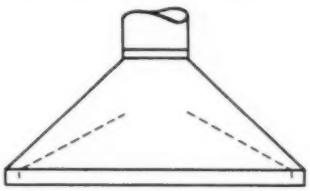


Fig. 1: Canopy hood for steam kettles, forges, etc.



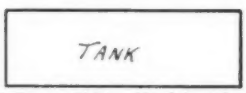


Fig. 2: Canopy with internal hood stops edge-leaks.

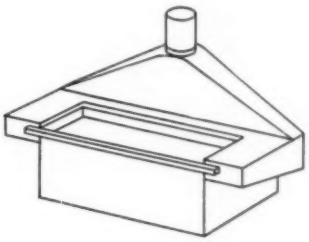


Fig. 3: Canopy with sides & back for kitchen exhaust.

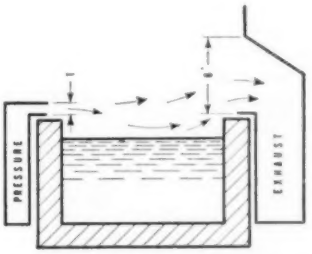


Fig. 4: Slotted hood at the back of plating tank.

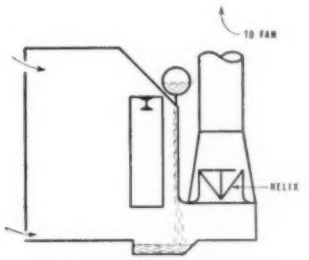


Fig. 5: Spray booth with water curtain.

and experiment with these. By moving them around to various strategic points, the best type of hood and the most nearly ideal locations may be determined. Hoods of the proper weight metal may then be prepared using the test hoods as patterns.

Piping Design

Correct ductwork design constitutes an important part in the effectiveness of a system. Many states have codes governing the size and constructional details of the ductwork. In addition all sheet metal shops follow standards established long ago for gauges and other details. Branch risers should always enter the mains from either side or overhead, never from the bottom. When branches enter from the bottom, any acid fumes exhausted from one tank may condense back into acid and this in turn may flow into the next tank. Should the solution in this tank be different than in the first, the acid that condenses and flows into it may possibly spoil the solution, or the mixture may be such as to create some unforeseen hazard. Care should be exercised to have all branches enter the mains in the direction of the air flow at an angle not greater than 45°. If the angle of entrance into the mains is too great, excessive resistance will be created.

"Mathematics of Design"

Velocities in mains, submains and risers should average 2500 to 3000 feet per minute. The cubic feet of air required is, of course, derived from the total required to exhaust approximately 150 to 200 CFM per square foot of hood area over the total of all hoods in the system.

The static pressure against which the system must operate is determined as follows:—

Starting at the point of maximum resistance compute the various resistance elements. Add them together to obtain the maintained resistance of the system. This point of maximum resistance may be either the riser farthest from the fan or a smaller diameter riser than the majority.

The first item to be considered in calculating this resistance is the work required to get the air started into the system. This will vary with the type of hood. Since it is impractical to determine this factor for the average exhaust system, it will be assumed to be ½ the suction at the throat of the hood (usually measured about 6" from the throat), or in the case of a velocity rating at hood throat the work required to get the air into the system as equivalent to the velocity head corresponding to the average velocity in the suction pipe. Expressed algebraically this is:

$$\text{Velocity head} = \left(\frac{\text{Velocity}}{4000}\right)^2$$

Field experience and tests have shown that the above will give close to average conditions. If more exact data is available as to entrance conditions, the pressure drop at the entrance may be corrected to suit. Past experience indicates that the entrance coefficient on this type of system averages around 70 percent, which is consistent with the above method of determining the work required to get the air started.

The next item to be considered is the pressure drop caused by friction between the air and the duct surface, and the action of the air particles against each other. To figure this pressure drop, start at the point of maximum resistance and add together the friction drop for each component comprising the duct. Past experience has shown that one velocity head drop in 50 diameters of length of pipe will cover the normal friction drop and provide an allowance for the effect of unevenness in commercial pipe.

Expressed algebraically the pressure drop in straight round galvanized iron pipe, when handling air at standard density, is determined by the following formula:

$$P. = \frac{L}{50} \times \frac{12}{d} \times i$$

where:

P. = Drop in inches of water
L. = Length of pipe in feet
d. = diameter of pipe in inches
i. = Velocity head $= \left(\frac{V}{4000}\right)^2$
v. = Velocity in feet per minute

For rectangular ducts the pressure drop is increased by the ratio of the perimeter of the rectangular duct to the perimeter of a round duct of equal area.

Pressure drop in elbows is most easily allowed for by adding to the straight pipe, before figuring the friction in same, an additional length to cover loss in the elbows.

For each elbow having a center line radius equal to twice the pipe diameter, add 8 diameters of length; for center line radius equal to pipe diameter, add 12 diameters of length; and for mitre elbows add 50 diameters of length.

Occasionally fumes must be removed as much as possible from the air before discharging into the atmosphere. This is usually done by passing the air through air washers. In this process the air passes through one or more banks of nozzles, each emitting a fine spray that washes the fumes from the air. Manufacturers of this type of equipment should be consulted regarding the pressure drop through the washer.

The air is finally discharged, usually through the roof, into the atmosphere. When discharging through the roof, it is customary to provide a cap at the discharge to keep rain from entering the ductwork. Resistance for this cap varies depending on the type. Normally, 0.1" to 0.2" can be expected.

The summation of the work required to get the air started into the system, plus the resistance in the pipe, resistance *(To page 30)*

View of the impregnated wood fire-door. This door excelled in gruelling ASTM 60- and 90-minute fire exposure tests—in which applied temperatures reached in excess of 1800 degrees. Continuous temperature recordings revealed an exceptionally low heat transmittal by the non-combustible door. There was no trace of weakening or burning found.

This view of the spacious main lounge on the world's largest post-war ocean liner, the Caronia (Cunard White Star Line), reflects the dominance of wood and wood paneling in the beautifully executed interior. The chemically impregnated, fire-resistant wood provides luxurious comfort for passengers and gives a new element of safety.

WOOD THAT WILL NOT BURN

A wood is now available that is permanently non-combustible.

BY RENDERING wood fire, rot and vermin-resistant in one economical impregnation, a special process has opened the door for almost revolutionary changes in the use of lumber and plywood by safety engineers.

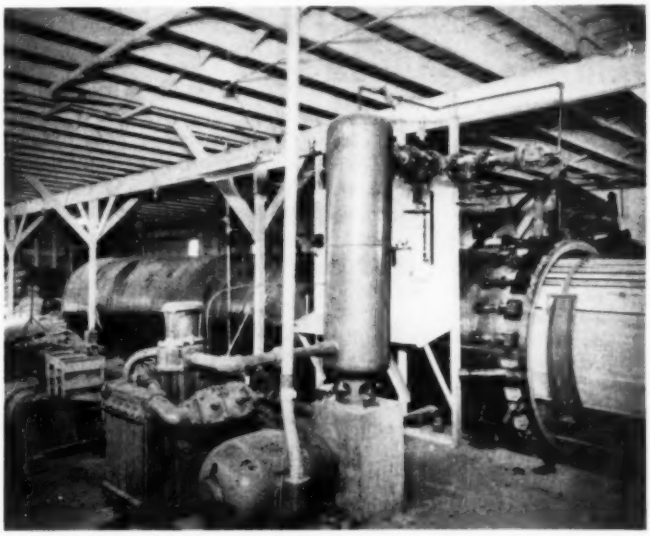
Treated in a sealed cylinder on which a vacuum has been drawn, a special chemical solution is forced into wood under extremely high air pressure. This complete impregnation, differing from non-permanent surface "treating" methods, renders the wood permanently fire, rot and vermin-resistant. As proof of the effectiveness and lasting power of this impregnation method, Underwriters' Laboratories, Inc. list the fire-retardant wood as *permanently non-combustible!*

Impregnation Improves Qualities of Wood

Of vital importance to all who use wood—either for construction or for manufacturing purposes, the natural beauty of the wood is retained—without the hazards of fire, rot and decay. Many additional qualities are in fact *added* to make impregnated wood superior: Reduced porosity, resulting from the chemical impregnation, increases nailing-and-fastener strength by providing solid embedment of the nails or fasteners. And since the chemical acts as a filler, the treated wood takes paint better than untreated wood. Due to the inclination of moisture to remain near the exterior surface in treated wood, there is less tendency for the lumber to expand and contract, retaining closeness of joints and fits in construction—and reducing the possibility of cracks and checks.

Demand for Fireproofed Lumber Increasing

Although this chemical-impregnation process has been proven and used in commercial fireproofing



Load of lumber entering the impregnating cylinder. By forcing the chemical solution into the wood under extremely high air pressure, the lumber is impregnated, made fire, rot and vermin-resistant.

service for more than fifty years, many factors are combining to speed up the general use and demand for fireproofed lumber.

The public, faced with much publicized tragedies such as the Cocoanut Grove fire in Boston, the LaSalle Hotel fire in Chicago, Winecoff Hotel fire in Atlanta and the recent St. Anthony Hospital fire in Effingham, Illinois, is becoming aware of the need for fireproofing materials used in construction. And as the fact becomes known that the additional cost of constructing homes, apartments, hospitals and schools with this fireproofed lumber is less than 4% of the total construction cost, public acceptance and demand for fireproofed lumber is increased rapidly.

Architects and builders, cognizant of the superiority of wood as a construction material can embody its natural beauty in wider usage—and on more of their jobs—without the danger of fire. New and more extensive uses for fireproofed lumber, both as a structural material and as a decorative medium of distinction and character—are creating a constantly increasing demand for chemical-impregnated fireproofed lumber. And in industry, where safety engineers and industrial maintenance engineers are faced with the task of reducing fire hazards in old as well as new construction, fireproofed lumber offers an economical, practical answer to their problems.

From Ocean Liners to Window Frames!

Manufacturers, eager to utilize the beauty of wood, are recognizing the added safety—and sales advantages of such lumber fireproofed by proven methods.

One outstanding example of the use of fireproofed wood where beauty of design and craftsmanship—plus safety—are of vital importance is found in the recently completed Cunard palatial liner, the *Caronia*. One of the most magnificent ships afloat, this liner boasts more than thirty-two rare woods and veneers—from Australian Maple Butt to Zebrano—all treated—that were used to enhance the beauty and safety of its interiors.*

Other products, that belong in the "every-day" living category are being manufactured of fireproofed lumber to enhance their value to consumers. Typical of these many varied products is the window, made entirely of impregnated fireproofed lumber. These modern windows add the factor of complete safety from fire to their many outstanding features of improved window design to help build product preference.

A specially processed, impregnated wood fire door, designed for the protection of openings in fire partitions and fireproof partitions, was recently approved by the New York Board of Standards and Appeals after extensive ASTM tests. With the applied temperatures reaching in excess of 1800 degrees during the 90 minute test, the wood fire door showed no trace of weakening—no burning—and revealed a transmittal temperature of only 230 degrees F. This extremely low transmittal value makes the wood fire door a superior means of preventing the spread of fire through communicating openings.

New Services Speed Fireproofing

Impregnating plants are located strategically throughout the country to offer quick and economical impregnating service for lumber and plywood. Treat-in-transit privileges, such as the new service offered in a St. Louis impregnating plant, opens the door for fireproofing of lumber and plywood as it goes from the manufacturer to the dealer or consumer—and at no increase in rail rates. Carload lots can be fireproofed in as little time as six hours—and the shipment delivered at the through rail rate—providing new economies to the consumer as well as the manufacturer of lumber and plywood. Less than carload lots can be trucked to processing plants—impregnated—and returned in less than 24 hours, to make the rapid fireproofing service available to the large as well as the small dealer and consumer.

With costs lowered, service streamlined—and with public and professional demand for fireproofed lumber increasing, the future for lumber and plywood both as construction material and for consumer products has never been brighter.

Safety Engineers who are interested in learning the name of the process and the name of the company which manufactures the fireproof windows and doors and offers the processing service can secure further information on inquiry to the Editor.

Pictures by courtesy of the Fox Brothers Manufacturing Company.

* See the February, 1949 issue of SAFETY ENGINEERING.

Union Praises Management

LOCAL 2497 of the United Steelworkers of America has recently passed a unanimous resolution praising the work of management in preparing and carrying out a unique "human factor" safety program for the protection of all employees. The Hannah Furnace Program was organized at the suggestion of the Robert Coleman Service Company, and is responsible for a tremendously lowered accident rate and excellent worker morale. It is based on the assumption that 80% of accidents are caused by unsafe acts as against 20% by unsafe conditions. Intensive foreman education and a system of psycho-therapy in improving the accident prone, has secured such a vast improvement that the Local branch of the union felt impelled to state that "a letter of commendation be sent by Local 2497 to those responsible for the planning of the Hannah Furnace Safety Program."

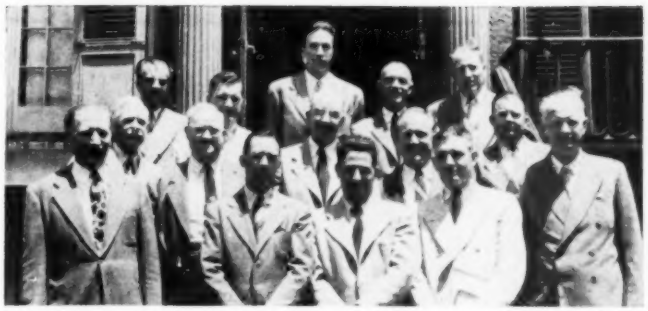
Ebasco Holds Second Safety Seminar

SAFETY and personnel executives from ten states and from Mexico, Cuba and Brazil met recently to attend a Seminar in Public Utility Safety. This course, held June 13–24, was the second such seminar held this year by Ebasco Services Incorporated in cooperation with New York University.

Contents of the course are specifically designed to teach safety and operating personnel of utilities the modern practices and techniques in accident prevention and to acquaint them with the latest developments in the field. The seminars were planned on the basis of need for such a course expressed by Ebasco client company executives who realized that most safety men are picked from the ranks and that some formal training in safety organization, procedures and techniques along with actual practice in speaking and instruction in effective human relation would be highly beneficial.

Classes included Effective Speaking, Effective Relations, Formulas for Supervision, Conference Leadership and Safety Training, Utility Safety Programs, Motor Vehicle Safety, Visual Aids and Fire Prevention and Protection. Field trips were made to the training school of the New York Telephone Company at Long Island City, to the Waterside Plant and Fire Protection School of Consolidated Edison Company of New York and to Fort Jay on Governor's Island where the group was instructed by Captain H. M. Fergusson (Rtd.) in the comprehensive driver training program followed by the First Army.

The Association Panel, a unique feature of the seminar, was held at headquarters of the American Gas Association, 420 Lexington Avenue. Representatives of the accident prevention activities of the American Gas Association, Edison Electric Institute, American Transit Association, American Institute of Electrical Engineers, American Society of Safety Engineers and the National Safety Council, outlined the work of their respective associations in the field of safety and answered questions of the seminar group.



Some of the members and faculty of the second Ebasco Seminar in Public Utility Safety photographed on the steps of the Faculty Club of New York University on Washington Square. In the front row from left to right: Dr. Walter A. Cutter, C. K. Shelton, C. Van Wickler, R. L. Conway, Jr. and Dr. Herbert J. Stack. Second row: W. T. Rogers, E. V. Olson, W. J. Easton, W. Ismay and V. A. Howell. Last row: M. Castro, V. L. Womeldorff, L. E. Haughey, Jr., E. F. Matheson and C. D. Murdock.

Courses at the University were under the auspices of the Department of General Education and were conducted by Dr. Herbert J. Stack, Professor of Education and Director of the Center for Safety Education and his assistant, Dr. Walter A. Cutter, Assistant Professor of Industrial Safety, assisted by Professor Milton D. Kramer and Dr. Dawson F. Dean. Ebasco sessions were conducted by G. G. Blair, Fire Protection Engineer and W. T. Rogers, Safety Consultant of Ebasco's Insurance Department. The entire seminar was directed by the Ebasco Safety Consultant.

Heinrich Book to Have Spanish Translation

BECAUSE of the many requests, a Spanish edition of H. W. Heinrich's 450 page book entitled "Industrial Accident Prevention" has been made with permission of the author, and is now being printed.

This book will be available within the next few months to members of the Inter-American Safety Council at $5.00 per copy and to non-members at $6.00 per copy, plus postage.

The Spanish edition, like the English, will be illustrated throughout its 450 pages.

The chronological and historical background of the industrial safety movement are given in appendixes. The essential principles of accident prevention are described in the first chapter, thus providing a narrative picture of modern accident prevention methods in condensed form and in one section. Chapter Two describes basic philosophy that underlies the treatment of the subject in subsequent chapters. Chapter Three is devoted to an explanation of the practical work of accident prevention in various types of industries.

In order that the publisher may know the approximate number of copies to be printed, persons interested in securing this book should address inquiries to: Inter-American Safety Council, Inc., 2 Rector Street, New York 6, New York.

TRANSPORTATION

Battery Gases Are Explosive

THE gases issuing from a charging battery are a mixture of hydrogen and oxygen and will explode with great violence and spraying of acid if a spark or flame is brought too near them, warns the Navy Department's "Safety Review." The gases are not dangerous when diluted sufficiently with air but a room or compartment in which charging batteries are confined should be ventilated. Four percent hydrogen in the atmosphere is said to be dangerous. Do not bring a flame or sparks near vent openings until gases have been cleared from cells by blowing air into them gently.

When restrictive self-leveling devices are used in the vent openings and the liquid is at "full" level withdraw (temporarily) enough electrolyte so that the hydrogen gas trapped in the cell can be blown out with a gentle stream of air.

Due to the presence of impurities in all battery cells small quantities of hydrogen gas are given off at the negative plates even when the cells are not being charged. It must be assumed therefore that hydrogen gas may be present within the cells at all times. A torch, match flame, lighted cigarette or sparks from metal tools accidentally laid across the terminals might cause ignition of hydrogen. To avoid sparks do not disturb connections between batteries while charging—throw switch "Off" at charger first.

The possibility of ignition of hydrogen gas by static electricity accumulated on a car or on one's person and discharging near the vent openings can be minimized if, immediately before working on the battery, a metal rod or wire is touched to the car bumper and to the ground.

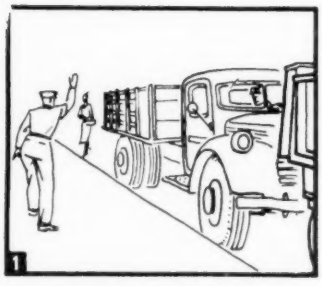
If for any reason acid electrolyte should be spattered in the eyes, wash it out immediately with copious quantities of clean, cold water cupped in the hands. Seek medical aid.

Rules to Follow

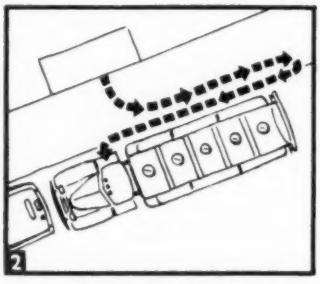
The report of an explosion which occurred at a Coast Guard light station where a storage battery was being charged indicates that personnel should be repeatedly cautioned to exercise care in charging storage batteries. Evidently an arc was caused when the leads were removed in this case, which ignited

Backing Accidents Can Be Prevented

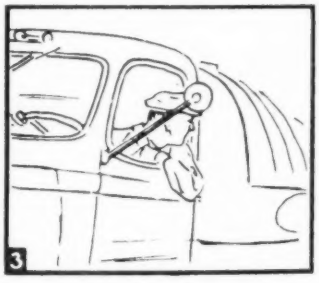
Driving-safety obliges a driver to dismount and observe the area in the rear of his vehicle immediately before backing.



WHEN A HELPER OR SWAMPER IS AVAILABLE, IT IS HIS DUTY TO DIRECT YOU.



IF NO HELPER (OR SWAMPER) IS PRESENT, *EXAMINE* THE AREA IN THE REAR OF TRUCK.



GET IN—LOOK OUT DIRECTLY TO REAR—AND BACK *SLOWLY*.

From the American Petroleum Institute's "Accident Prevention Information for Marketers."

the explosive mixture within the cells and ruptured the battery, showering acid and possibly battery parts over the vicinity.

If you recharge or handle batteries, know the following:

1. Venting of charging compartments must be complete.

2. Battery caps should be tightly screwed in place whenever the leads are connected or disconnected.

3. Never connect or disconnect leads with power being supplied to or released by the battery.

4. Use battery-servicing equipment to avoid splashing or spilling of acid.

5. Never attempt to blow off loose particles or corrosion on the top of a battery by mouth or air hose. A brush should be used. Brush away from you and keep your face as far away as possible.

6. Do not wear rings while servicing a battery as severe burns may result.

7. Keep lighted matches, cigars, cigarettes, and all open flames away from batteries.

8. Keep hands away from face while servicing battery and wash thoroughly when through.

9. Use battery tongs or other appropriate carrying devices when removing or lifting batteries.

10. Follow manufacturer's instructions when operating battery recharging equipment.

11. Acid—Battery electrolyte must be handled with great care as it will blister the skin and damage clothing. It is advisable to wear goggles, rubber gloves, and a protective apron when working with it. Neutralize acid electrolyte spilled on clothing with diluted ammonia water or a water solution of baking soda. If acid solution above 1.835 specific gravity gets on clothes dilute it with clean water first and then neutralize.

Defensive Driving

AS THE driver of your automobile or truck, you have only one control and that is over your own actions and the resulting actions of your motor vehicle. You have absolutely no control over weather or road conditions or over the actions of other drivers or pedestrians.

In addition, then, to your primary defense which includes obeying all traffic laws and avoiding mistakes in your own driving, you must set up a secondary defense which is just as important. That secondary defense, which we call "Defensive Driving," is your only hope for accident-free driving. It involves the operation of your automobile in such a manner as to avoid the accident situations created by the mistakes of others and by weather and road conditions.

Defensive driving means yielding the right-of-way when, by all rules of the road, it is actually yours. It means an unbroken series of concessions to other drivers who are thoughtless, unskilled or ignorant of the hazards they create.

Defensive driving can also be called "Defensive Distrust." Every hand signal or indication by movement of the other driver's car is "taken with a grain of salt," and our actions are so governed as to maintain control of our vehicle in every occurrence.

Defensive driving includes defensive discretion, which is that little added measure of caution which prepares for the unexpected. For instance, when the driver passes near children playing, he is imbued with an attitude of defensive discretion whereby he limits his speed and alerts his reflexes to react momentarily in order to avoid hitting a child who might impulsively run into the street.

Many, many are the benefits of defensive driving. Be on guard, take advantage of them.

From the "Safety Digest" of the Texas Co.

Mechanical Handling for Safety and Savings

THROUGH the use of storage battery-powered fork trucks, The Manhattan Storage & Warehouse Company has revolutionized the handling of huge overseas shipping cases and crates in its mid-town building situated just off Times Square, New York City. An operation that required three to four men some 30 to 45 minutes to perform, now takes an approximate seven minutes, with but two men engaged. In addition, the full vertical storage capacity of the 18-foot, floor-to-ceiling area of its first floor, is made available to the company. Since The Manhattan Storage Company receives quite a few of these cases, ranging in weight from 4,000 to 8,000 pounds, these savings and advantages are most important.

The company installed the fork trucks some five years ago. At the time, officials of the company realized that through the substitution of mechanized for manual methods of handling, certain advantages would be realized. Among these were the ability of the company to handle more items in a given time, with less congestion caused by waiting trucks on the crowded streets adjacent to the block-square, multi-

A flatbottomed highway truck moves into one of the loading-unloading bays in the mid-town building of the Manhattan Storage & Warehouse Company, carrying an overseas packing case weighing some 4,000 lbs. Storage battery-powered fork trucks work from each side of the highway truck's bed, lift the case and permit the highway truck to move out. Under manual methods, it was a hazardous operation for 3 or 4 men.

story warehouse building. Also, material could be handled with more safety to personnel and to the items handled, while they also were interested in the flame-free, clean service that battery-powered trucks would render.

Under the manual methods of handling that prevailed up to five years ago, overseas cases would be removed from highway trucks by means of a windlass, blocks and rollers, and deposited on large, wheeled dollies. This operation would, as previously stated, occupy three or four men, including the highway truck's driver, anywhere from 30 to 45 minutes. The highway truck stood idle. For movement to upper floors, the case would be moved by crowbars and dollies, and the labor of three men, on to an elevator. At destination the same procedure would be followed. The time for this would be another 30 to 45 minutes.

Under present methods as the highway truck backs into an unloading bay, two fork trucks drive up, one to each side of the highway truck. The forks are driven under the load, are raised in unison, and the highway truck drives out. It is a rare matter for the highway truck to be in the building for more than 10 minutes. Generally the time is far less, and so short is the stay that the truck's driver doesn't have to leave his seat.

Since The Manhattan Storage Company doesn't have control of the manner in which the trucks are loaded at the piers where the overseas cases are received, most of the cases are loaded in such manner as to require the use of jacks and a windlass, or of two trucks to remove them. If they were placed on dunnage so that a fork truck could place its forks far enough under, only one truck would be required to lift and remove the case at destination.

Moving Goods Inside the Warehouse

If there are a number of cases being received for storage, each case usually is placed to one side of the unloading bay in temporary storage, being tiered two-high by means of a fork truck. When all incoming items have been "checked in" they then are moved to upper floors.

Access to the nine floors of the mid-Manhattan building is gained by any of five large 10-ton capacity elevators. Each has a floor area of 8 x 21 feet. This permits the handling of the largest cases—even crated automobiles. One or both of the fork trucks ride with the load to assist in horizontal handling at destination.

As stated, it formerly required from 1½ to 2¼ man-hours to handle a large shipping case from receipt to the warehouse floor, while movement from the loading platform to upper floors would engage from six to eight men, with an expenditure of an additional three to four man-hours. Total man-hours now required from receipt into storage is from 40 minutes to one hour.

"Savings such as these are substantial," said J. Barclay Potts, Vice-President of the Company. "Multiply them by five days for our work-week and you can see why we value our fork trucks. We also have the full use of the 18-foot floor-to-ceiling storage area on our first floor. This formerly had practically gone to waste owing to the difficulty of utilizing it by purely manual methods. The safety factor, both as regards personnel and the goods we handle, also is greater while, of course, there is an absence of fire hazard, noise and fumes, through the use of our

Picture shows the overseas shipping case, weighing approximately two tons, being tiered in temporary storage by means of one of the fork trucks. Operation of unloading required 7 minutes.

battery-powered equipment."

In addition to the two fork trucks, use also is made of a number of battery-powered hand trucks. These mostly are used on the upper floors for movement of merchandise that has a constant incoming or outgoing flow. This includes the handling of cases of wines and liquors which dealers store in the warehouse vaults.

While some use is made of pallets, reliance for movement of cased goods is placed on skids, of which about 300 are utilized. These are stored on the floors where use is greatest. A limited number of pallets also are provided for each storage area.

Pictures by courtesy of the Electric Industrial Truck Association.

Driving Awards

TRUCK drivers for Fisher Body Division of General Motors led the nation for safe driving among the large trucking groups of over 50 units during 1948 with an average of less than one accident per 100,000 miles of driving, it was announced recently by J. J. Cronin, vice president of GM and general manager of the Fisher Body Division. The national accident rate for truck drivers in 1948 was 2.7 accidents per 100,000 miles.

There were only 57 accidents—all of them of a minor nature—in 8,034,000 vehicle miles, or an average of .71 accidents per 100,000 miles. Fisher Body used 193 drivers and 248 vehicles (trucks, tractors and trailers) last year in compiling its unusually low accident rate.

Safe driving certificates issued by the Detroit Industrial Safety Council have been awarded to 105 Fisher Body drivers for going through the year without an accident, Cronin added, pointing out that of this number, three have finished 21 consecutive years of driving without an accident.

Eighteen Fisher drivers have gone 10 or more years without a single accident, and in more than 30 years of trucking operations, there have been no fatal accidents involving Fisher drivers.

The drivers are stationed in Detroit, Lansing and Flint, Mich., and almost all of the driving has been within the state of Michigan shuttling between Fisher Body plants and various GM car assembly plants, carrying steel, body stampings, parts and entire Fisher bodies. The drivers handle some of the largest trucking equipment on the highway.

Yale Traffic Institute

JUDGES, justices of the peace, and prosecutors from all sections of the east will have an opportunity to attend a five-day court and traffic law administration conference September 12 to 16 at the Yale Law School, Yale University, New Haven, Conn. The conference will be conducted by the American Bar Association, with the cooperation of the Traffic Institute of Northwestern University and will be held in conjunction with the Yale Institute for Traffic Training September 6–16.

Purpose of the conference is to help provide judges and prosecutors with the special knowledge and skill so necessary in dealing with the traffic violator problem. This is the first such conference to be held at Yale and the tenth in a series being conducted at universities throughout the country.

Another judges' and prosecutors' conference will be conducted October 17–21, 1949, on the Northwestern University Law School in Chicago, Ill.

Subjects to be covered in the conference include: The Traffic Accident Problem and Principles of Control, Traffic Court Operations, Application of Criminal Law and Law of Evidence, Model Traffic Ordinance, Elements in Reckless Driving Charge, Factors Influencing Driver Performance and Means of Improvement, Civil and Criminal Responsibility in Traffic Accident Cases, Physical Laws Affecting Motor Vehicle Operation, Legal and Scientific Aspects of Chemical Tests for Intoxication, Functions of the Prosecutor, and other related subjects.

Further information and registration forms may be obtained by writing to the American Bar Association, 105 West Monroe Street, Chicago 3, Ill., or the Traffic Institute, 1704 Judson Avenue, Evanston, Ill.

Included in the seven courses and seminars being offered in the Yale Institute for Traffic Training is one in which judges and prosecutors will be especially interested. It is a five-day course in chemical tests to determine intoxication to be given September 12–16. The course provides instruction in various kinds of chemical tests of breath and body fluids to determine intoxication, and emphasizes individual instruction and opportunity for development of laboratory proficiency. It is conducted by the Northwestern Traffic Institute and is open to police officers, public health employees, coroners, medical examiners and other municipal or state personnel who may be called upon to determine the degree of a person's intoxication.

Other Courses

Other courses to be offered during the Yale Institute for Traffic Training, which is sponsored by leading organizations in the traffic field, include:

Traffic Police Training, September 6 to 16; Traffic Engineering, September 12 to 16; Accident Records and Their Uses, September 12 to 16; Driver Education and Training, September 12 to 16; Pedestrian Protection, September 12 to 16, and Seminar on Public Support Program Planning, September 14 to 16.

Additional information on any of these courses may be obtained by writing to: Institute for Traffic Training, Bureau of Highway Traffic, Strathcona Hall, Yale University, New Haven 11, Conn.

New Research Center Designed For Safety

ONE of the most versatile and up-to-date chemical research centers in the world is just being put into operation by Carbide and Carbon Chemicals Corporation, according to Dr. G. O. Curme, Jr., Vice-President of Carbide and Carbon Chemicals Corporation and Vice-President—Chemicals Research, Union Carbide and Carbon Corporation. This new organic chemical research center is located on a 140-acre tract near the company's South Charleston, West Virginia, plant. Construction was begun in March, 1947. When finally completed, it will be the largest single laboratory project the Corporation has ever undertaken.

To House Fundamental Chemical and Resin Research

Built for the purpose of continuing and expanding the basic research work that, in the past, has given birth to the corporation's well-known anti-freeze, plastics, and bottled gas products, the new establishment is equipped according to the most recently developed requirements for chemical research. As typical examples of the many unique features, ingenious supports in each laboratory permit complete versatility in the location of laboratory furniture and equipment, and each laboratory can draw on any one of 14 separate utilities from permanent outlets—including such unusual services as cold brine, oxygen, hydrogen, nitrogen, and steam at either 15 or 200 lb. per sq. in.

Safety Engineer Available

Qualified Safety Engineer with 10 years of field and executive experience in industrial and construction safety. Good educational background. References. Age 45. Employed at present time but desire to make change. Write to Box 726, c/o SAFETY ENGINEERING, 75 Fulton St., New York 7, N. Y.

At present only the main research building, devoted to basic research, is being occupied; four large development buildings are to be occupied in the future. The completed project will eventually house fundamental organic chemical and resin research, as well as process development work for the Chemicals Corporation.

The programs in the new research center will concentrate on the design of new chemical molecules. Research will be directed to the development of new plasticizers, new synthetic resins, and new organic chemicals for agricultural and other uses. This work, as in the past, will continue to be supplemented by the heavy programs of research on the applications of chemicals in the Organic Synthesis and Chemical Hygiene Fellowships sponsored by the company at the Mellon Institute of Industrial Research, Pittsburgh, and in the Biological Research Fellowship at Boyce-Thompson Institute of Plant Research, Yonkers, New York.

In the past, the fundamental research on organic chemicals carried out by Carbide and Carbon Chemicals Corporation has resulted in the commercial production of many new materials upon which whole industries have been founded. For example, the series of vinyl resins developed by Carbide and Carbon's Research Laboratories gave impetus to a new plastics industry, by opening huge new markets for flexible plastics to be used in fabrics, coatings, molded objects, electrical insulation and many other fields. More recently, polymeric materials such as the polyethylene glycols, synthetic lubricants, and resinous plasticizers; a new line of fungicides, fly repellents and other agricultural chemicals; and several thousand other organic chemicals have been synthesized. These are becoming of substantial importance commercially in an almost infinite variety of uses.

Typical of the flexibility of Carbide's research personnel was the rapid development of the process for synthesizing butadiene from alcohol, an integral factor in the success of the synthetic rubber program during the recent war. Coincidentally with this badly needed process, a new styrene process was brought into large scale production in record time.

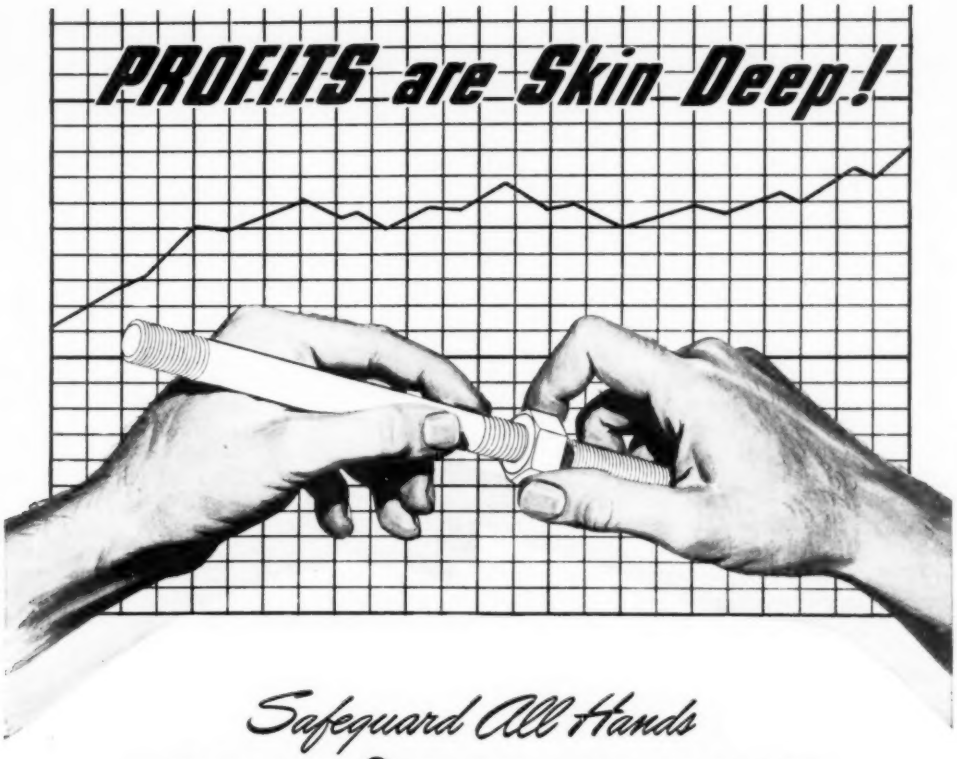
Novel Mechanical Features

Mechanical features of the new laboratory building include a number of novel arrangements and installations, with emphasis on versatility and employee safety. Complete air conditioning, vibration absorption, a multitude of safety appliances, fluorescent lighting providing an average of 40 foot-candles at all working levels, and the most modern laboratory services and furnishings are all incorporated.

Laboratory services play an important part in the construction of the building, for every effort has been made to dispense with unsightly temporary fixtures. There are actually 14 separate and distinct utilities available to each laboratory desk. In addition to the usual services, such as hot and cold water, distilled water, cold brine, fuel gas, compressed air and vacuum lines, all the laboratories are supplied with nitrogen, steam at 15 lb. per sq. in., and outlets for 110 volt a.c. with a built-in variable voltage control for controlled heating. Provision has also been made, wherever needed, for installing 200 lb. steam, oxygen, and hydrogen, as well as 220 volt a.c. Outlets for connections to laboratory apparatus are located at the rear of each bench to permit removal of the furniture without disturbing the service lines.

All the laboratories and offices of the buildings are air-conditioned. Air is supplied at a maximum of 80 deg. F. and 50 percent relative humidity in the summer and at a minimum of 70 deg. F. and 25 per cent humidity in the winter. These conditions are maintained by a 600-ton refrigeration unit. Incom-

PROFITS are Skin Deep!



Safeguard All Hands

with WEST LAN-O-KLEEN HAND CLEANER...

(contains protective lanolin)

Up or down? Which way your profits go may depend on your production efficiency. That means vigilance against the man-hour losses resulting from industrial dermatitis. Here's where WEST LAN-O-KLEEN HAND CLEANER proves invaluable—for it gives your workhands good protection against the costly effects of various skin irritants.

A quick-acting, thorough cleaner—LAN-O-KLEEN contains no harsh ingredients or excessive alkali. Prepared of a fine cornmeal base, it effectively removes deep-rooted grit, soil and grime—yet it's *gentler* on sensitive skins. Nor is that all! LAN-O-KLEEN is *superfatted* with a *higher percentage* of soothing, beneficial *lanolin* than are *ordinary* super-fatted soaps. Impregnated into LAN-O-KLEEN by an exclusive process, this lanolin has been proved to have a retarding effect upon the defatting action of soap. As a result, the skin gets added protection against natural oil-losses.

LAN-O-KLEEN, in powder form, is dispensed through an economical soap dispenser especially designed for the product. Numerous plants have made it a wash-up standby. We'll be glad to show you how your plant can profit by it.

SEND FOR FREE SAMPLE

WEST DISINFECTING Company

42-16 West Street,
Long Island City 1, N. Y.

WEST DISINFECTING COMPANY
42-16 West Street, Long Island City 1, N. Y.

Gentlemen:
Please send me a free sample carton of LAN-O-KLEEN.

Name _____ Position _____
Company _____
Address _____
City _____ State _____ 19

ing air is cleaned by electrostatic precipitators. Each room has a thermostat for individual temperature control. In addition, one laboratory room is equipped with a special unit to provide constant temperature and humidity conditions.

Elaborate precautions have been taken to prevent contamination of office areas, and cross-contamination between laboratories. This is accomplished by providing each laboratory with an individual exhaust fan of sufficient capacity to remove the conditioned air supplied to the room plus that supplied to the office areas. Thus, each laboratory is under a slight negative pressure with reference to the offices and corridors.

Most of the laboratories are equipped with fume hoods. Since the operation of a fume hood requires much more air than can be economically supplied from the conditioning system, each hood has an independent supply of clean, tempered air. When a hood is placed in operation, the air supply duct is opened and the exhaust fan speed is doubled. Both of these operations are accomplished by throwing a single lever.

Vertical duct systems for air conditioning and fume hood exhausts are all located in the center of the building adjacent to columns. In this fashion, ductwork is held to a minimum and is hidden from view.

Safety Devices

Employee safety has received careful consideration. As mentioned, the air conditioning system is designed to prevent contamination of the building with toxic or flammable vapors. In addition, the basement and pipe shafts are continuously purged by exhaust fans located in the penthouse. The doors from the laboratories to the 100-yd. long corridors are double hung and swing outward, one leaf being provided with panic hardware. At the opposite end of each laboratory is an escape door to the adjoining room. The stairwells and exit doors are so located that it is possible to leave by at least two routes from any point in the building.

To insure personnel safety, the laboratory center has the following: a fully equipped medical dispensary with a nurse in attendance, an eye-washing fountain in each laboratory, and safety showers, blankets, stretchers and gas masks in the corridors. Fire protection equipment includes a "rate of rise" detection system that actuates a central station alarm in the telephone switchboard room as well as alarm bells in other parts of the building; two small carbon dioxide extinguishers in each laboratory, and numerous larger ones as well as fire hoses with fog nozzles in the corridors.

Safety Equipment Manufacturers Elect

LAWRENCE E. DICKSON, president of the Standard Safety Equipment Co. of Chicago, was elected president of the Industrial Safety Equipment Association for the second consecutive year at the Association's annual meeting held early in June at Shawnee-on-Delaware, Pa.

Pres. L. E. Dickson

Vice Pres. C. H. Gallaway

Charles H. Gallaway, Sales Manager of American Optical Company's Safety Products Division, was elected vice-president of the Association, succeeding Walter G. Legge. During the past year, Gallaway served as a member of the Planning Committee. William J. Parker of William J. Parker, Inc., New York City, was elected secretary-treasurer of the Association.

The Industrial Safety Equipment Association was organized in 1934 by leading manufacturers of safety equipment to develop and maintain a high standard of quality in safety products. Other objectives of the group are the promotion of ethical business practices in the industry and dissemination of information about safety equipment and its proper use. About 35 member firms are represented in the Association, and a spokesman for the organization indicated that future growth will progress rapidly.

How to Control Fumes

(Continued from page 29) offered by the air washer and the rain cap if washing down the fumes is necessary, plus the resistance offered by any other special features, constitutes the total maintained resistance to be overcome.

One other point should warrant consideration in the design. This is the corrosive action of the fumes. The action of all gases involved on the various metals used for ductwork should be carefully studied. Ductwork should then be made of materials that are resistant to the gases handled, or a suitable coating should be provided. Many coatings are manufactured today that are ideal for resisting acid gases. The temperature of the gases and the moisture content also have a definite bearing on the corrosive action, and complete information should be provided the manufacturer of

Eye HAZARD SIGNS

STONEHOUSE SIGNS
For Accident Prevention

SAFETY FIRST
WEAR GOGGLES OR USE SHIELD
SAVE YOUR EYES WEAR GOGGLES
SAFETY FIRST
WEAR YOUR GOGGLES WHEN GRINDING
NOTICE
ALL PERSONS WORKING IN THIS DEPARTMENT MUST WEAR GOGGLES
DANGER
WEAR GOGGLES WHEN HANDLING ACID OR SOLDER

The Glasses of Confucius

FOR centuries the Chinese have worn glasses, tho in those early days they knew nothing of the grinding of corrective lenses.

The first definite historical reference to the wearing of glasses is found in the writings of Confucius, about 500 B. C.

Marco Polo, the explorer, who visited China during the reign of Khublai Khan, in the 13th century, A. D., also states that he found aged persons in the empire wearing spectacles with tortoise frames.

* * * * *

Those old Chinese spectacles were really GOGGLES, because they were made of plain crystal and simply shielded the eyes. So the wise old Chinese were the first to say "Wear Your Goggles."

That's the message, in many forms, which features Stonehouse "Goggles" and "Eye Hazard" Signs, shown in our catalog No. 8. It's free on request.

Stonehouse SIGNS, INC. Stonehouse Bldg. • 9th at Larimer • Denver 4, Colorado
MANUFACTURERS

"Stonehouse Signs Since 1863"

ACCIDENT PREVENTION SIGNS IN STANDARD COLORS AND DESIGNS

the ductwork or the supplier of the coating so that proper recommendation can be made. Ducts that are corroding are a definite hazard to the health and safety of the entire personnel of an organization so that this feature cannot be over emphasized.

Explosive gases must also be guarded against. When these are encountered, extreme caution should be exercised to insure that no sparks can reach any of the fumes. Non ferrous metals should be used throughout the system and all points that offer a source of static electricity should be grounded. Explosion relief dampers and vents should be provided at strategic points. One explosion can cost more in life and property damage than an adequate number of exhaust systems properly installed and equipped would cost.

Fan Selection

Selection of the right type of fan to convey the fumes is of the utmost importance. Several factors must be considered in order that the fan be suitable for the job. Among these are the following:

1. Amount of air to be conveyed and resistance to be overcome.
2. Operating cost.
3. Are the fumes explosive?
4. Do the fumes contain grease?
5. Will the fumes have a corrosive action on the fan?
6. If corrosive action will exist, is the design of fan such that a protective coating may be applied?
7. If the fumes are explosive, is the fan design such that explosion proof features may be included.

For the average small diner or restaurant, where any fumes to be removed may be discharged directly into the atmosphere, a propeller type fan may be employed. This should be connected directly to a totally enclosed motor, rather than belt driven, as grease and oil fumes are likely to attack any belting. The totally enclosed motor should be used to eliminate any danger of sparks' igniting the grease that is certain to collect on the fan parts. Belt driven units may be used if the belts are properly shielded, but this is most difficult to do, as a certain amount of the fumes will almost always leak into any shield that can be devised.

For any installation in diners or restaurants, where the fumes are carried a short distance through a duct, an axial type fan or a paddle wheel centrifugal type fan should be employed. Propeller type fans should never be used if the fumes must be conveyed through a duct, as the resistance occasioned by the duct is likely to be excessive. Propeller type fans are designed normally for operation where no resistance is encountered.

Where moderate resistances exist, an axial flow type of fan may be used, while the paddle wheel centrifugal type fan is the answer to the problem created by high resistances. Wheels having backwardly curved blades should not be used where grease and oil fumes are encountered, as any grease collecting on the blades will throw a backwardly curved blade wheel out of balance.

While the above has stressed grease and oil fume removal, the same will apply to paint spray booths and similar applications. Regardless of which type fan is employed, special consideration should be given to protection against corrosion and sparking as mentioned earlier in this article.

To exhaust the fumes from plating tanks and other applications that require the removal of large quantities of air, either paddle-type or backwardly curved bladed centrifugal type fans should be employed. Either type will work satisfactorily, if properly engineered. The housings should always be equipped with drains to remove any condensation or entrained moisture. Bearings should never be exposed to the contaminated air, as any acids in the air will cause bearing failures in a short time.

Pictures and drawings by courtesy of the B. F. Sturtevant Division of the Westinghouse Electric Corporation.

New Method of Protective Coating

A SUCCESSFUL method for the flame spraying of polythene on metal surfaces has been developed by the Engineering Research Laboratory of the Du Pont Company. It is considered a practical system which should find application in industry.

Polythene is unusually inert and thus is highly resistant to corrosion. Because of this characteristic, the material is particularly attractive as coatings for metal surfaces, such as tanks and drums, where corrosion is a factor. However, polythene has been difficult to apply by conventional methods because of its relative insolubility.

The problem in working out a satisfactory method of application was to melt the polythene particles and hold them at as high a temperature as possible without overheating them. Early work resulted in markedly degraded coatings and poor adhesion.

Flame-Spray Method

The satisfactory method now developed was accomplished by devising a spray gun in which the flame is obtained by mixing the fuel gas and the air needed for combustion beyond the torch nozzle, rather than by premixing them. Flames 8 to 12 inches long are used and the gun is held so that the surface to be covered is about 2 inches from the tip of the flame.

The surface must be pre-heated to 400 to 500 degrees F. and small quantities of finely powdered graphite or carbon black promote adhesion. By this method, approximately 16 square feet per hour can be covered.

Tests indicate that adhesion is good and that the temperatures used do not degrade the polythene. Exposure tests of 300 days' duration with sulfuric, hydrochloric, and other acids have shown no deterioration in coating properties or base metal attack.

3

Soles You Can Rely Upon to

NEO-CORD

An outstanding sole made of DuPont Neoprene and stout cords. Non-slipping . . . long wearing. Ideal for wear on oil, grease, gasoline, acid or caustic covered floors. The finest sole between feet and floor.

DON'T LET YOUR SLIPS SHOW

REDUCE ACCIDENTS

Due to Slipping

GRO CORK SOLES

Tough natural rubber impregnated with cork. Won't pick up metal chips, outwears leather, is waterproof, and insulates feet against heat or cold. Best for steel riggers, rock quarries, shipyards, foundries, creameries, and metal cutting departments.

TRADE GRO CORD MARK
CORD ON END

Actual tests prove Gro-Cords will outwear at least two leather soles. Cord-on-end construction combined with natural rubber makes these soles slip-proof and waterproof. Perfect for yard men, constantly wet floors, loading docks, etc.

GRO-CORD RUBBER CO., LIMA, OHIO

Canadian Plant

GRO-CORD RUBBER CO., TILLSONBURG, ONT.

Work Injuries Continue Decline

WORK-INJURY rates in manufacturing industries continued to decline during the first quarter of 1949, according to reports received by the U. S. Labor Department's Bureau of Labor Statistics. The average injury-frequency rate for all manufacturing establishments reporting in the first quarter was 6.5 percent below the comparable figure for the preceding quarter and 18.4 percent below the average for the first quarter of 1948.

Secretary of Labor Maurice J. Tobin pointed out that this decline in injury rates was greater than would have been expected as a simple seasonal variation and reflects to some extent the impact of President Truman's national safety campaign which has as its objective the reduction in half of industrial accidents in the next 3 years.

The lower injury rate, coupled with a decrease in employment, resulted in a drop of over 10 percent in the estimated number of work injuries. Approximately 93,000 workers in manufacturing establishments were disabled for one or more days because of work injuries during the first quarter of 1949. This is 11,000 below the estimate for the fourth quarter of 1948, and 21,800 below the first quarter a year ago. The toll of human life, however, is still high; over 300 workers died as a result of their injuries, and 4,800 others were known to have suffered some permanent physical impairment. Some of those injuries classified as temporary disabilities at the time of the report may later become more serious, requiring a slight increase in these estimates.

About 1,860,000 man-hours were lost during the quarter by these injured workers. At current wage levels, this represents an estimated value of about 19 million dollars—a loss paid partly by employers in the form of workmen's compensation and partly absorbed by the injured workers in the form of reduced income during the period of disability. This, however, is only a portion of the total cost which will accrue from these injuries. It includes no allowance for the continuing economic losses arising from the many deaths and permanent impairments, or for hospital, medical, and other costs incidental to the treatment of these injuries.

Reductions in injury-frequency rates were recorded for 47 of the 117 manufacturing classifications for which comparable data were available. For 26 industries the rates were higher, and for 44, they varied by less than one frequency-rate point.

Only 3 industries showed injury-frequency rates of over 40. These were: Logging (reported for the first time this quarter), 95.9; sawmills, 56.9; and integrated saw and planing mills, 44.0.

Outstandingly low rates were reported by the following: Synthetic rubber, 1.2; explosives, 1.2; optical and ophthalmic goods, 1.6; electric lamps (bulbs), 2.7; plastic materials, except rubber, 3.3; synthetic textile fibers, 3.6.

Center for Safety Education Announces Fall Courses

TIMELY programs of courses in industrial and traffic safety are announced for the fall term beginning September 26, by the Center for Safety Education, Division of General Education, New York University. The expanded curriculum makes it possible for students electing a full program of ten courses to secure either a Certificate in Industrial Safety or a Certificate in Traffic Safety. Career opportunities in the developing fields of industrial- and traffic-accident prevention are open to trained men and women. These courses are offered as a service to industry and safety personnel.

The following courses will be offered in the fall term. Other courses, completing certificate requirements, will be offered beginning February 6, 1950.

Required Courses

- SC 1—Accident Prevention—Its Background, Objectives, and Relationships
- SC 2—The Philosophy and Basic Principles of Accident Prevention
- SC 3—Industrial Hazards, Mechanical and Personal—Control Methods
- SC 8—Fire Prevention and Protection Inspection
- SC 9—Organization and Administration of Traffic Safety Programs — Industrial, Community, and Governmental

Elective Courses

- SC 11—Vision in Industrial Safety and Motor Vehicle Operation
- SC 12—Effective Speaking in Accident Prevention
- SC 14—Principles of Safety Inspection

All courses are given in the evening at the Center. Complete information about these courses may be secured by writing or telephoning the Center for Safety Education, 8 Fifth Avenue, New York 11. Telephone—SPring 7-2000, Extensions 312 and 632.

LET A NEW PRODUCT LIFT YOU OUT OF THE SUMMER DOLDRUMS:

Nylon Goggle
Ladder Shoes
Floor-Dry
Acid Container
Extra Size Glove
Cover Lenses
Safety Carboy Drainer
Pants Guard
Insecticidal Paint
Eyeshield

See pages 70–71

"Why doesn't our company do like other companies?"

If you haven't yet installed a Payroll Savings Plan in your company, you can be pretty sure some of your employees are asking that question. For workers *like* this easy, automatic way of investing in U. S. Savings Bonds—and more than 20,000 large companies have made this convenience available to the people on their payrolls.

WHAT GOOD IS "PAYROLL SAVINGS"?

The Payroll Savings Plan is the *only* means by which people can obtain Bonds automatically on the installment plan. It pays off in many ways: increased security for the individual, who gets back $4 for every $3 when the Bonds mature; company benefits due to improved worker morale—a reduction of absenteeism, labor turnover, and accidents; increased national security, because Bond sales spread the national debt.

HOW MANY CAN AFFORD BONDS?

Deductions for taxes and other purposes which reduce take-home pay should not be confused with allotments for Bonds, which are taken home as *interest-paying savings*. Of course, the cost of living makes it tough for some people to buy Bonds. But nation-wide experience indicates that 40-60% of the employees in any company can be persuaded to sign up for Payroll Savings—without high-pressure selling.

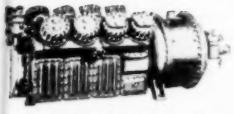
7,500,000 workers are regularly buying an individual average of $20 of Savings Bonds per month. Show your employees that you want them to have the convenience of Payroll Savings. You'll find it easy to set up the Plan in your company. All the materials and assistance you need are available from your State Director, U. S. Treasury Dept., Savings Bonds Division. (See your phone book.) Why not talk it over with him now?

The Treasury Department acknowledges with appreciation the publication of this message by

SAFETY ENGINEERING

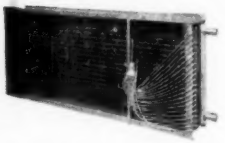
This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

MORE FEATURES THAT REALLY COUNT-- IN THESE STURTEVANT HEATERS



REFRIGERATION COMPRESSORS

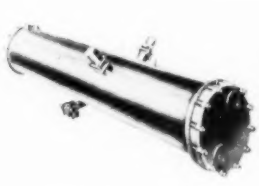
AXIAL FLOW FANS



HEATING AND COOLING COILS

Why? Because these heaters are the product of the combined experience of two great leaders—Westinghouse in electricity; Sturtevant in heating and ventilating. This means, too, that you get undivided responsibility, superior performance and a wide range of capacities to choose from — assuring the most efficient heater to fit your particular needs. For years of uninterrupted heating service, get in touch with your nearest Sturtevant office, or, write Westinghouse Electric Corporation, Sturtevant Division, Hyde Park, Boston 36, Mass.

Everything that puts air to work for Every application

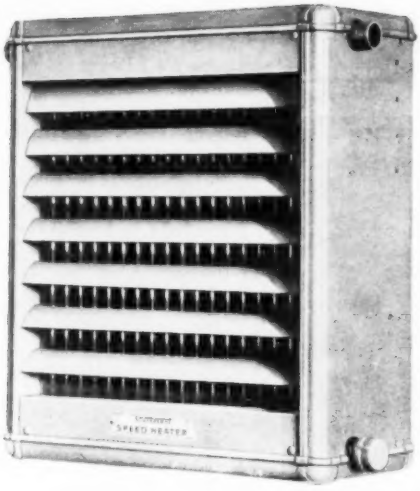


REFRIGERATION CONDENSERS

CENTRIFUGAL FANS

UNIT AIR CONDITIONERS

J-30144

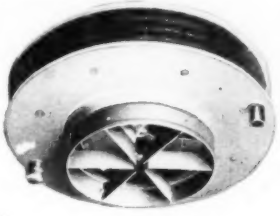


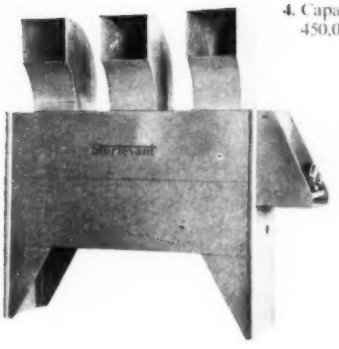
SPEEDHEATER®

1. Fast Heat Delivery—Assured by efficient, quiet-operating fan
2. Low Maintenance Cost—Single-row radiator assures uniform tube expansion, freedom from radiator distortion. Longer life. Tested for 200-lbs. steam pressure
3. Dependable Westinghouse Motor—Backed by nationwide Motor Service Plan
4. Simplified Installation—Inlet and outlet connections on either side
5. Easily formed Handy Hangers—At no extra cost
6. Capacities—From 25,000 to 300,000 Btuh

DOWNBLAST SPEEDHEATER

1. Excellent Heat Distribution for High-ceiling Applications
2. Greatly Reduced Ceiling Heat Loss, Lower Fuel Costs
3. Connections on Both Sides Save Piping Costs
4. Capacities From 40,000 to 450,000 Btuh

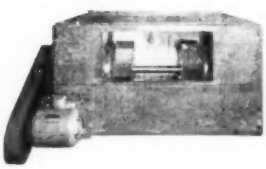




MULTIVANE HEATER

1. Large Volumes of Heated Air, Evenly Distributed
2. Rugged, Simple Construction; Working Parts Easily Accessible
3. Installed on Floor, Wall or Ceiling
4. Capacities, 44,100 to 1,177,000 Btuh

Westinghouse
Sturtevant Division



AIR HANDLING UNITS

PRECIPITRON® (ELECTRONIC AIR CLEANER)

SURFACE DEHUMIDIFIERS

SAFETY ENGINEERING Salutes a Safety Idea for August

Safety Education at the Point of Operation

An unusual and effective method of promoting safety by use of motion pictures is being used at the Ambridge, Pa. plant of The National Supply Company.

The equipment is set up and the pictures shown to groups in the particular area of the plant where the men work—and on company time. In the eighteen months since this program was started the accident frequency has been reduced considerably. Part of this improvement can be attributed to the program.

Most of the films shown run about fifteen minutes. After the projector and screen are set up in a central location of the department, the men are called from their jobs fifteen minutes before the quitting time of the day shift. After the film has been run, the first shift is replaced by the men reporting for the second shift.

Lee Crane, of the Industrial Relations department of the plant, reports that showing the films where the men work makes them feel more at home and more receptive to the safety suggestions.

The films are shown at three months' intervals, Mr. Crane believes that if the showings were more frequent they would lose their novelty and effectiveness.

A regular 16mm sound projector is used, but mill noises required the addition of an outdoor type directional speaker. To obtain constant volume and picture brilliance in some locations a voltage regulator is used because of the voltage drop in the line. A portable six-foot screen without a hood has been found adequate.

FREE BULLETINS & CATALOGS that can wise you up to safety are reviewed on page 69

New Developments in Liquid-Proof Clothing

(From page 13) as easily as glass.

Among the articles made of this plastic are:

Industrial rain coats
Acid-proof aprons
Sleeve protectors
Work suits
Extra-light industrial aprons
Heavy-duty aprons

Synthetic rubber industrial protective garments include:

Work coat of single coated fabric sheeting.

Waterproof, oil-resistant work coat with double back.

Double back industrial coat for construction, transportation and agricultural workers.

Heavy duty work suit for protection against corrosive chemicals, oil and grease. Recommended also for wash-up men, boiler service men, and sand blasters. Made in heavy duty and medium weights.

Storm suit with hooded parka. Completely weather-proof, this two-piece lightweight garment has excellent resistance to oils, chemicals and solvents.

White police coat for easier visibility on dark, stormy nights.

Melton and fleece-lined and regulation fire coats.

All types of aprons, ranging from the oilproof, acidproof, caustieproof and waterproof double-coated shop apron to heavy-duty industrial and laboratory aprons and dairy and canners' aprons.

Rubber Footwear

Industrial footwear of rubber is also undergoing extensive changes. Special-purpose American-made rubber with extremely high resistance to chemicals is being used in the new lines which are made by a special process so that boots have no seams or joints. The rubber also withstands cracking and oxidizing under exposure to light and ozone.

Several different types of the

footwear have been tested in chemical plants, refineries, abattoirs and other fields not only to determine their resistance qualities but also to check new special features, one of which is a heel liner of a new material whose resistance to abrasion gives much longer wear. Another is a laceless work shoe whose construction permits instantaneous removal from the foot should a worker spill injurious acids inside it.

The industrial rubber footwear line includes policeman's and firefighter's boots, fishermen's boots, safety shoes and boots with steel toes capable of withstanding 125 foot pounds for use in mining and in industrial plants.

Rubber Gloves

To illustrate the important role that the protective functions of rubber gloves can play in American industry and in the home, more than 90 per cent of industrial and home accidents affect the hands.

So many different types of rubber gloves are manufactured for such a multitude of purposes that it is impracticable to list them all. But mention should be made of a new development -- roughened fingers and palms which are an integral part of the glove. These "sandpaper" grip gloves enable workers to handle objects quickly and efficiently, and at the same time they reduce damage and breakage. The roughened fingers and palms have been incorporated also in household gloves to reduce breakage of cups and saucers when milady is washing dishes.

Another development, less recent but still worthy of comment, is the protective rubber glove made by a special process from liquid latex. This is a method of manufacturing rubber products by dipping a form into the liquid latex. A uniform deposit of rubber adheres to the form, even between the fingers where some types of gloves are weak. A swinging arm rotates the forms after immersion so the latex does not run to the fingertips.

EXPERIENCED ENGINEERING DEVELOPS NEW, QUICK-ACTING FIRE EXTINGUISHER

TESTS tests and more TESTS!

Now ready!

C-O-TWO DRY CHEMICAL TYPE FIRE EXTINGUISHER

Test after test, changes, improvements, simplifications . . . now the new C-O-TWO Dry Chemical Type Fire Extinguisher is ready, having features that make it one of the most efficient, fool-proof, easy-to-use fire extinguishers known.

SELF-CONTAINED UNIT... no extra gadgets protruding or complicated operating instructions . . . a real down-to-earth fire extinguisher that does a highly efficient job.

C-O-TWO DRY CHEMICAL IS FREE FLOWING . . . no syphon tubes or valves within the cylinder to become clogged or inoperative . . . special dry chemical formula developed to ensure proper flow . . . discharge hose and nozzle remain empty until fire extinguisher is actuated.

TWO CONVENIENT SIZES to fit your fire fighting needs... 20 pound capacity and 30 pound capacity . . . both engineered for fast, positive action the instant fire strikes.

APPROVED . . . Underwriters' Laboratories, Inc. rating is B-1, C-1. C-O-TWO Dry Chemical is non-conducting, non-corrosive, non-freezing and non-toxic . . . highly effective on flammable liquid and electrical fires.

ON-THE-SPOT RECHARGING... no special tools needed... C-O-TWO Dry Chemical for recharging is sold in handy pre-measured 20 and 30 pound sizes as well as in a 50 pound bulk size . . . all sizes packed in durable moisture proof containers.

Act now for complete free information on our newest contribution to modern fire fighting . . . just clip this advertisement to your letterhead or calling card and mail today . . . no obligation.

C-O-TWO

C-O-TWO FIRE EQUIPMENT COMPANY
NEWARK 1 • NEW JERSEY
Sales and Service in the Principal Cities of United States and Canada
AFFILIATED WITH PYRENE MANUFACTURING COMPANY

IS TELEVISION SAFE?

THE rapid increase in the use of television receivers has brought to the National Board of Fire Underwriters a flood of inquiries as to the relative fire and life hazards of television sets, and as to their proper installation and the installation of their antenna systems.

Since television operates on essentially a line-of-sight basis, proper reception usually necessitates an exterior antenna and as the distance from the television transmitter increases, the antenna must of necessity extend higher in elevation. This increases somewhat the possibility of damage by lightning, and, as the antenna is usually mounted on a pole or tower on the roof, there is a possibility that, unless properly installed and supported, the system may fall in high winds, dropping across power lines or injuring persons or property.

The National Electrical Code, in Article 810, contains provisions covering radio receiving aerials, but these provisions were designed primarily to cover conventional radio installations and do not appear adequate for the special conditions of television. Revisions of Article 810 looking to proper coverage of television installations are now being considered by an appropriate committee of the National Electrical Code. In the meantime, the provisions of Article 810 should be followed with respect to installation of lightning arresters on the lead-ins. Arresters for ordinary radio aerials are not suitable for television, but proper arresters are available. These arresters should be placed on each conductor of a ribbon-type lead-in. If a co-axial cable is used for lead-in, suitable protection will be provided by grounding of the exterior metal sheath.

Grounding

Where the antenna is mounted on a metal pole or tower, the pole or tower should be properly grounded. Opinions vary as to the size of the grounding conductor, but it should preferably be at least a No. 6 or 8 Awg., connected to a suitable ground such as an underground water pipe, and if the building is equipped with a lightning rod system, should be properly bonded to this system.

The type of lead-in commonly used is the polyethylene ribbon type. Although this material burns much like rubber, and falls in flaming drops, its use for this purpose is not considered particularly hazardous. Recent improvements of the polyethylene lead-in, although still flammable, have eliminated the flaming drops. The co-axial cable lead-in is generally considered the best from the fire hazard viewpoint, but is considerably more expensive and has operational disadvantages.

Considerable care should be given to the mechanical stability of the antenna and its support. Where located on the roofs of buildings the antenna and supporting guys should not be so located as to interfere with operations of the fire department or where liable to crosses with electric power lines. Some fears have been expressed as to the possibility of shock hazard on contact with an antenna or lead-in, because of the high voltage used in the receiver, but these fears are groundless if the receiver is properly designed.

Fire Hazards

It is generally considered that a television receiver has a greater inherent fire hazard than a conventional radio receiver, because of its greater current consumption, a greater number of heat producing components and the higher voltage used. Particular care should be taken that the natural ventilation built into the set is not obstructed or reduced by location or blanketing. Television sets should not be left turned on while unattended.

Television sets of several manufacturers have been listed by Underwriters' Laboratories, Inc., as having been acceptably designed and constructed with respect to the fire and life hazard. Prospective purchasers should assure themselves that the set they contemplate purchasing is listed by the Laboratories.

Guides to Handling Chemicals

(Continued from page 17) very carefully and thoroughly prepared methods of arriving at the labeling and furnishing precautionary information on the labels for the various commodities handled by member firms of the Association. The work of this Committee has been recognized and forms standards for many regulatory bodies, such as State Labor and Health Departments. The Committee is made up of a large representative group of scientists, physicians and technically trained personnel of member firms of the Association.

The next logical step in developing this precautionary information was the formation of a Committee to expand on the precautionary information for member firms, and for general public use. To accomplish this the Executive Committee of the Association decided upon the formation of a National Safety Code Committee to prepare a code comparable in scope with other National codes, such as the National Electric Code. The Executive Committee selected a group of technicians, including safety engineers, chemists, production representatives, engineers and physicians, to prepare a National Chemical Safety Code. After careful study a preliminary committee decided and recommended to the Executive Committee that in place of a National Chemical Safety Code, individual Safety Data Sheets be prepared, each one with specific recognized safety information regarding individual chemical products. Therefore, early in 1945 the Execu-

tive Committee established a General Safety Committee for this purpose.

Chemical Safety Data Sheets

The first action of this Committee was to arrive at a method of working. This involved preparing an outline of the future Chemical Safety Data Sheets. It was finally decided, after the outline had been reviewed by other Technical Committees, to include the information shown in Table I on page 17.

Following the adoption of the outline by the General Safety Committee, it was further decided to prepare an informative bulletin on the method of preparing the Chemical Safety Data Sheets. This bulletin is designed for the guidance of the author of the Technical sections of the Safety Data Sheets and it is an important tool of the General Safety Committee.

Next the Committee decided upon and prepared a list of definitions to be utilized in the preparation of the Safety Data Sheets. In this case the Committee utilized reliable sources of information, such as definitions already prepared and agreed to by the Labels and Precautionary Information Committee, standard definitions prepared and recognized by the American Standards Association, National Fire Protection Association and other reliable and recognized scientific sources.

The Committee then recognized that in order to lend value and secure professional medical advice, the cooperation of the Medical Advisory Committee of the Association was essential. Therefore, early in 1945 the two Committees, namely, the General Safety and Medical Advisory, met and established a working relationship so that in the preparation of the Sheets, the General Safety Committee or a selected author, would prepare the material for the first seven sections of the outline (called the Technical Sections) and simultaneously the Medical Advisory Committee would prepare information under Section 8 "Health

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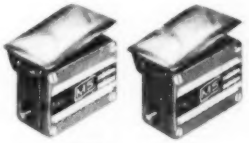

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Hazards and Their Control." At the end of each Data Sheet there is a notation that "The medical information in this publication has been supplied by the Medical Advisory Committee of the Manufacturing Chemists' Association, Inc."

This is important, in that the user may tactfully advise and provide his physician with information accumulated by practicing chemical industrial physicians who from long experience have developed medical techniques which should serve as a valuable guide to other members of the medical fraternity. For example: the average practicing physician probably never has attended a case involving an HF burn or severe HF respiratory exposure. Should one arrive for his attention, time is of the essence and first medical treatments are vital to rapid recovery, elimination of pain and control of scar formation. Therefore, with the Chemical Safety Data Sheets in his possession, the user of HF can bring to the attention of his physician information contained in the sheets which will be of great value to both the physician and patient. At the same time it should be understood that we as laymen are not prescribing but are passing on information accumulated by medical authorities.

Regarding preparation of an individual Safety Data Sheet, the first step is to choose and decide on an author for the Technical Sections 1 to 7. This author is frequently a non-member of the General Safety Committee, but is a technically informed person from one of the producers of the product being covered. He is furnished with the outline previously referred to, method of preparation previously referred to, complete list of the definitions adopted by the General Safety Committee, and always has at his command previously prepared Safety Data Sheets. Therefore, he is in a position to slot into the various portions of the outline the information desired, and he deviates from the outline only as it is necessary to treat individual products, wherein such treatment will improve and expand the usefulness of the Safety Data Sheet.

With the selection of the author for Sections 1 to 7, the Medical Advisory Committee simultaneously selects an author to prepare Section 8, "Health Hazards and Their Control." The co-authors are, of course, free to consult with Technical personnel associated with them, or other sources that can contribute to the general knowledge required.

When these two portions of the Data Sheet are prepared in preliminary draft, they are forwarded by the authors to the Washington Office of M.C.A. where the Executive Committee has established a Permanent Secretary for the General Safety Committee. He then reviews and forwards copies of the draft to each member of the General Safety Committee, to each member firm who is a producer, to each Chairman of Technical Committees, and to any large user who may contribute substantially to the final publication. The various recipients then review the preliminary draft,

either individually or in committee, and forward their comments within a specified time limit to the Secretary of the General Safety Committee in the Washington Office. The Secretary then correlates the suggestions with the authors and prepares a final draft of the Safety Data Sheet. If controversial points are raised, subcommittees are appointed so that these issues may be ironed out and the final method of presentation agreed upon. Each individual submitting a suggestion or recommendation is advised of the disposition of his comments or recommendations.

As a last step, prior to publication, the sheet is reviewed by the Editing Committee of the Manufacturing Chemists' Association. The work of the General Safety Committee and the other Technical Committees who contribute to the formation of Chemical Safety Data Sheets is gratuitously furnished by the member firms. Many of the Committee members of M.C.A. serve jointly on other nationally important Safety Committees and activities; and many, by their long association in Safety and allied activities, have established themselves as national authorities on this vital subject.

A review of the Safety Data Sheets published to date will show that in many of the sections important safety information has been repeated, to such an extent that if one is to read a sheet in its entirety a feeling may be obtained that there is too much repetition. However, there is a reason for this treatment. Frequently the person using the Sheet may be interested only in "Storage," and while cross referencing is liberally used, it has been the opinion of the Committee and its decision to make each section more or less complete in itself.

As the preparation of Sheets has progressed, it has been found advisable to give a uniform treatment to certain portions of all sheets, for example, the sections on "Respiratory Equipment," "Tank Cleaning and Repairs." Therefore, subcommittees have worked out uniform treatment which is applicable to all sheets. To date thirty-two sheets have been distributed and are available to member firms and the general public. Nearly 200,000 copies of sheets have been distributed.

In distributing these sheets free copies are sent to various Technical Colleges and Universities, as well as to Government agencies and bodies such as State Departments of Labor and Health. Also, some 30 insurance companies receive free copies.

These Chemical Safety Data Sheets are guides designed for the use of both laymen and technically trained individuals. They are compiled from sources believed to be reliable and represent the best current information available at the time of their preparation and publication. The men preparing these Sheets, have, from long experience and intimate knowledge of the products, arrived at methods, which, if the information contained in the sheets is adhered to, studied

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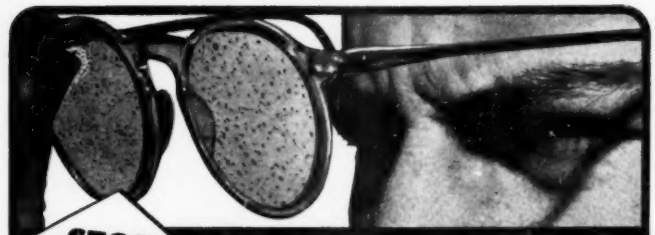

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and understood, will serve an extremely useful purpose in the prevention of personal injuries and the continuance of our ever-expanding National economy in the chemical industry.

Any chemical can be stored, handled and used with relative safety if the physical, chemical and hazardous properties of the material, whether in the form of solid, liquid, dust, vapor, gas, or mist, are understood, if all necessary precautions are observed, and if necessary safeguards and personal protective equipment are provided and used.

The Board of Directors of M.C.A. have established a policy so that sheets are available to the general public at the same price at which they are available to member firms. These sheets are obtainable from the Manufacturing Chemists' Association, 246 Woodward Building, Washington 5, D. C., and remittance covering cost of sheets should be forwarded with the order.

From an address presented at the 15th Annual Philadelphia Safety Conference.

Fire & Safety Courses at NYU

THE Graduate Division of the College of Engineering, New York University, is offering graduate courses in fire protection engineering and safety engineering primarily designed to make graduates fire and safety conscious in their practice of engineering.

Mr. Edward J. Kehoe, Chief, Safety and Fire Protection Section, New York Operations Office, U. S. Atomic Energy Commission conducts the fire course on Wednesday nights. The safety course on Thursday nights is given by Mr. Henry A. Cozzens, Jr., Industrial Consultant.

The courses are ordinarily open to college graduates only; however, applicants qualified by experience may also be accepted. Registration will take place September 14-16 inclusive, 6:30-8:30 P.M., South Hall, University Heights.

Further information may be obtained from the Assistant Dean, College of Engineering, New York University, New York 53, N. Y.

Electric Eyes See Dangers

(From page 11) rate may be from ten to several hundred gph, this time lag may allow a dangerous quantity of oil to enter the combustion chamber.

Photoelectric flame detectors eliminate time lag because the response is not from temperature but from the flame. Light from the flame is received by the phototube and keeps the relay energized. If light intensity from the flame decreases for any reason the relay drops out, and obviously this method will be more responsive than temperature drop. Furthermore, a phototube is employed, which is primarily sensitive to the blue end of the spectrum, and the red hot brickwork will not falsely keep the relay energized. The blue light varies directly with the flame, and the relay can quickly detect any reduction or increase in intensity. Flame detectors contain a one tube amplifier circuit, which is energized only when actuated by a flame. Therefore, the furnace is always protected, as the burner will shut down if a tube or relay fails.

Holders for locating phototubes at a position to view the flame have been designed to keep the phototube cool and require little maintenance. Temperatures of red light sensitive phototubes must be kept below 212° F. while blue light tubes are limited to 140° F. Lenses or windows must be wiped clean at periodic intervals depending on actual conditions. Advantage is taken of negative furnace pressures to reduce deposits of dust and soot, but after long intervals collection on windows might be the cause of an unnecessary shutdown.

Smoke Density

Several types of smoke density indicators, alarms, and controls have come into prominence lately employing the photoelectric principle. A light source in a suitable holder is mounted on one side of the breaching, and projects a beam

through a hole in the wall to a phototube similarly mounted on the opposite side. Photoelectric current will be proportional to light intensity—high for no smoke and lower for increasing smoke densities. When amplified, the current can be read on a switchboard meter or be recorded on a conventional strip chart or circular recorder. The amplifier contains calibrating adjustments for making the meter readings correspond with actual smoke density. The meter is adjusted to read zero with no smoke present and to read No. 5 Ringlemann or 100% smoke with the light source turned off to simulate complete intereception.

Correlation between smoke density and combustion efficiency has been determined and having the meter in plain sight in the boiler room is helpful to the fireman. Sometimes relay circuits are added to equipment to provide warnings and eliminate the necessity of constant meter watching. The term "Photoelectric Smoke Density Control" is employed to describe equipment having two relay circuits, one operates when smoke is low and the other when smoke is high. An adjustment is provided to set each to its desired point. Relays are generally connected to indicating lights which tell the fireman the smoke condition, and they can also be adapted to automatically control smoke density within proper limits.

Cycling

Motor driven dampers, blowers, and air or steam jets can be controlled by photoelectric relays. However, because of an on-off relay operation the control system has a natural cycling action. Frequency of cycling can be kept low by proper design or adjustment of the control mechanism. For example, a large blower that delivers too much air will reduce smoke from the upper to the lower limit much faster than a smaller blower. Also, if the normal draft is set too low, smoking will occur too quickly after blower shut off.

Smoke Abatement

Photoelectric equipment can be incorporated into a smoke density indicator and alarm. In the interest of public health and cleanliness many communities have passed smoke abatement ordinances which require smoke density emitted to atmosphere be below a specified percentage. Photoelectric excess smoke alarms are devices to enable boilers to function without violations. Also, by installing recorders, proof of satisfactory operation is available for city inspectors.

Excess smoke alarm equipment is very similar to smoke control, but it has only one relay circuit which is adjusted in accordance to the local smoke density city ordinance. A light or bell may be employed to signal a violation, or near violation if adjusted to a slightly lower density. The relay can also

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CUFF UP — No dribbles on arms, no trickles inside gloves.

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DEPT. E

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be interlocked to reduce smoke automatically by operating dampers, blowers, or jets. Automatic control should be accompanied with time relays, and the devices operated for only a definite period, since a low smoke limit will not be indicated. Economies will be provided because of the prevention of incomplete combustion and ordinance violation, but excess smoke density control should not be confused with combustion control.

Protection

Photoelectric relays, of the chopped light type, act as day and night protection for plants against sabotage and unauthorized intruders. An invisible beam can be placed alongside a building or fence by aiming a transmitting unit at one end to a receiving unit at the other end. Distance between units may be as great as 1000 ft. with sufficient safety factor to compensate for light rain, fog, or snow. Beams can be bent around several corners or even completely around a building with strategically placed mirrors. Effective beam location will depend upon conditions at each site.

Each transmitter contains a lamp, beam forming lens, and an infrared filter to remove visible light from the beam. A chopping wheel turned by a motor interrupts the beam at a definite frequency. The amplifier circuit in the receiver is tuned to the beam frequency, and the relay will respond only to the chopped light. Therefore, an intruder shining a flashlight on the receiver cannot hold the beam when walking through. Furthermore, the chopped light permits greater amplification, which enables operation of equipment over a considerable distance and under adverse atmospheric conditions. Relay interruption when the beam equipment is connected to a battery powered alarm system will alert the guards. The circuit is closed at all times, but if a lamp, tube, relay or power fails an alarm will be sounded.

Many types of general purpose photoelectric relays are available which can be easily selected to actuate plant equipment such as counting small manufactured parts, door opening devices, safety and limiting devices. Among the benefits obtained will be better efficiency or greater safety.

Photoelectric relays have been operating in industry for over twenty years and they have held up with little maintenance even through abuses in some cases. Except in rare instances, electrical components never need replacement and tubes operate satisfactorily for over a year. Relay tips need attention occasionally, but by installing the proper types of arc suppressors electrical wear can be reduced considerably, and electrical life of the relay can approach its mechanical life, which may be as long as twenty-five million operations. The main attention needed by photoelectric relays is occasional removal of dust from lenses as the light switch cannot see with a dusty "eye."

Story and pictures by courtesy of "Industry and Power."

Dr. Price Now Consultant

AN ANNOUNCEMENT has recently been made of the availability of Dr. David J. Price for consultation on dust, fire and chemical research problems. After completion of 37 years of Federal Government Research Investigations, he retired from the U. S. Department of Agriculture on June 30, 1949. Problems which may be referred to Dr. Price (701 Whittier St., N. W., Washington 12, D. C.) are those relating to the design, construction, equipment and operation of chemical research laboratories; and those concerned with the causes of dust explosions and fires in industrial plants, with litigations resulting therefrom, and with safety measures for the prevention and control of dust explosions and fires.

Dr. Price organized the research work of the U. S. Bureau of Chemistry on Dust Explosions in Industrial Plants, and was Chief of the

Chemical Engineering Research Division. He was President of the National Fire Protection Association from 1942 to 1944 and Chairman of the Dust Explosion Hazards Committee from 1922 to 1942—a group which has aided in the development of safety codes for the prevention of industrial dust explosions.

As Chairman of the Committee on Plans and Specifications for various regional laboratories of the Department of Agriculture, Dr. Price has been responsible for the planning and arrangement of buildings and the design and installation of chemical laboratory equipment.

TEXTILE ACCIDENTS

OVER 85% of the accidents in textile plants, according to a recent survey by Robert F. Coleman Inc., result not from the failure of machines but from the failure of a worker.

Although the textile industry is composed of many types of plants and mills, the Coleman survey covering 1948 shows clearly that most accidents are caused by worker's inattention, lack of knowledge and instruction, and lack of caution. The largest single factor in the accident rate is inattention; this is responsible for over 37% of industrial injuries.

One mill covered in the survey reported 202 accidents during 1948. Of these only 9.02% were attributable to unsafe conditions existing in the factory, while 90.92% were the result of unsafe practices by the workers. In another textile plant with a record of only 51 accidents for 1948, 94.22% were caused by unsafe accident practices and only 3 could be attributed to mechanical defects or unguarded conditions.

Commenting on the survey Mr. Oberdorf, president of Robert F. Coleman, said, "The high incidence of what might be termed psychological accidents should really not have been a surprise to any of our clients for month after month our regular analysis of accidents in their mills have shown that the major causes of industrial injury are slips and falls, improper lifting and pulling of heavy objects, bumping against machinery and other workers, and being caught between moving objects through the careless handling of materials. This survey," he continued, "has brought into sharp focus the necessity for a revision and integration of our accident control program so that proper emphasis can be given to accident control through leadership. Control of accidents lies ultimately with the men in the shop. The responsibility for safety lies with the men's immediate superior, the foreman. By working with him to develop true safety consciousness and leadership we believe that it is possible to slash psychological accidents. Safety is in the mind!"

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SAFE-HI has straight ridges of mixed cord and rubber in the Tread.

For smooth, dry surfaces, you must have rubber . . because rubber holds firmly on DRY surfaces, but would slip on wet surfaces.

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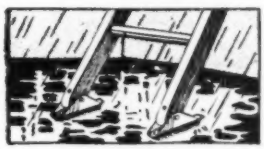
For snowy, icy surfaces, you must have a spike—and a sharp one . . because dull spikes are a hazard. The SAFE-HI spike is self-sharpening . . always sharp.



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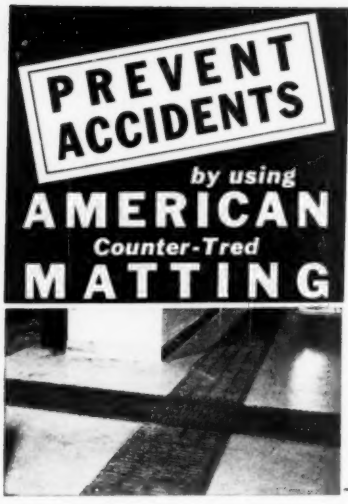

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Ideal for use around machinery where there is a minimum amount of oil.

Non-slip surface affords a feeling of complete safety to those who work in wet, slippery areas. Keeps the feet dry.

Exceptionally long wearing.

Resiliency affords comfort, reduces fatigue, increases efficiency.

Ridged bottom affords aeration and drainage. Lays flat.

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$\frac{3}{8}$-inch thick; 2 feet wide; any length in one-foot sections vulcanized together.

We also recommend Tuf-Tred Tire Fabric Matting, Neo-Cord Oil and Grease Resisting Matting, Amerriflex Flexible Wood Link Matting, Perforated Corrugated Matting, Ezy-Rug Colored Rubber Link Matting, Tile-Top Sponge Matting.

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"America's Largest Matting Specialists"

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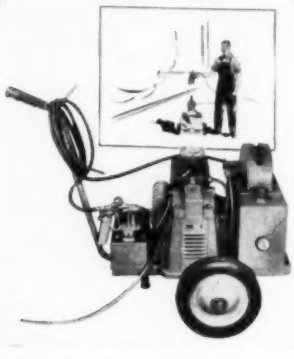
How to Control Industrial Insects

(Continued from page 15) unit, which has been developed after several years of continuous research, is available. This fine apparatus contains a $\frac{1}{2}$ H.P. compressor unit with a three gallon insecticide tank. The spray head of two nozzles uses the same nozzles as those which have proven so successful with the stationary atomizer. This unit, dispensing three ounces of insecticide per minute will completely fog a 10,000 cubic foot room in seven minutes to kill roaches and other crawling insects. The practical limit of this machine when used in one location is 50,000 cubic feet; one filling of the tank will take care of 200,000 cubic feet for roach control and 400,000 cubic feet for flying insects. In addition to this main fogging unit, it also contains a pressure-feed type hand-spray gun unit to be used for contact spraying. A simple valve diverts the air pressure from the fogging tank to the hand gun which contains 12 feet of air hose to enable out-of-the-way locations to be easily sprayed with insecticide.

For the smaller users of insecticides, a new hand unit designed for rugged, long lasting insect control at a very low cost is available. This hand unit contains many new features such as a new air-cooled motor which means that such a unit need not be lubricated by the oil base insecticide but may now use either oil or water base materials. This hand gun sprayer is available with or without an automatic time clock.



A portable atomizer unit has air compressor, 3-gallon insecticide tank and a hand spray gun. Versatile unit for local or area spraying.

A hand atomizer unit suitable for small plants or for local application of insecticide fog. It requires only an electric outlet for operation.

The fogging principal of insect control has been proven to be most effective and economical and is now a generally accepted method. Sanitation product manufacturers such as the West Disinfecting Company have kept abreast of technical developments and have been instrumental in providing new and better insecticides. At the same time, they have looked ahead in search of new and finer methods of application so that today they can provide a complete service, available to those in search of an economical and practical means of industrial insect control.

Picture copyright 1948 by the West Disinfecting Company. Used by special permission.

New List of ASA Standards

MORE than 140 new American Standards, approved since January of this year, are included in the midyear list of standards and special publications just issued by the American Standards Association. The list shows a total of 1124 standard specifications, methods of test, building requirements, dimensions, safety codes, definitions and terminology in all fields of engineering as well as for materials and equipment used by the ultimate consumer.

All of these have been given the status "American Standard" through the procedure of the Association which assures all groups concerned an opportunity to have a voice in their development.

Important new standards listed for the first time include a series on chemicals used in photographic processing, soap specifications, lamp dimensions and electrical characteristics, textiles, electrical indicating instruments, and building code requirements on signs and outdoor display structures. There are also two new American Standards in the series on small tools

and machine tool elements and a recently completed American Standard Plumbing Code.

Special publications offered include "What Good Are Standards," a handbook of practical answers assembled from the proceedings of the Thirtieth Annual Meeting of the Association, and "Democracy in Action," the story of the development of the Association. It also includes a report on "Nationally Recognized Standards in State Laws and Local Ordinances," issued in an attempt to find an answer to the problem of how nationally recognized standards can legally be put into effect and kept up to date.

The new list offers a complete set of all American Standards at $250 and a complete set of all American Safety Standards at $37.50.

The 28-page List of American Standards (July 1949) can be obtained from the American Standards Association, 70 East 45th Street, New York 17, N. Y. without charge.

10 SAFETY POINTS

THE lost-time injuries rate at plant of The Hoover Company in North Canton, Ohio, was reduced by almost nine-tenths during a concentrated three-month safety campaign in the first quarter of this year.

The carry-over effect of this plant-wide safety campaign was such that for the first six months of 1949 there were only 20 lost time injuries as compared with 57 for the same period of last year, a reduction of 64.7 per cent.

This record, in a plant that for 40 years has been producing vacuum cleaners, proves that, even where a continuous program of safety education and of safety engineering study to remove safety hazards has been carried on, substantial improvement can be made through a campaign that draws in every employee as an active campaign participant.

L. D. Humbert, Hoover safety engineer, summarized the accomplishments of their Carnival of Safety in ten points: 1. From the humanitarian standpoint, it prevented a lot of injuries and the suffering and handicaps that follow them. 2. It prevented the hardships to employees' families that follow loss of time and pay. 3. It impressed upon employees that management is interested in their safety. 4. It emphasized safety so that foremen and employees alike are spotting hazards and taking an interest in safety. 5. It showed that safety is not too complicated for every worker to understand. 6. It showed that accidents come from definite causes that can be controlled. 7. It proved that "accidents on the job are preventable." 8. It emphasized the need and importance of safety shoes for all factory workers. 9. It reduced accident costs during the three months and showed they can be permanently reduced. 10. It reduced the lost-time injury frequency rate here to an all-time low of 2.68.

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THE Future SHOWS

Cleveland, Ohio

Eleventh Annual Ohio State Safety Conference and Exhibit, Sept. 20–22. (Carter Hotel). Carl L. Smith, secretary-treasurer, 2073 East 9th St., Cleveland 15, Ohio.

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Chicago, Ill.

Thirty-seventh Annual National Safety Congress and Exposition, (Stevens Hotel), Oct. 24–28. R. L. Forney, General Secretary, National Safety Council, 20 N. Wacker Dr., Chicago 6, Ill.

New York, N. Y.

Seventy-seventh Annual Meeting American Public Health Association, October 24–28. (Hotels Statler and New Yorker). Dr. Reginald M. Atwater, executive secretary, 1790 Broadway, New York 19, N. Y.

Shreveport, La.

Ark-La-Tex Annual Industrial Safety Conference, Nov. 3, Charles E. Doerler, managing director, P.O. Box 806, Shreveport, La.

Cleveland, Ohio

First Plant Maintenance Show and Conference, Jan. 16–19. (Auditorium). Clapp & Poliak, Inc., exposition management, 341 Madison Ave., New York 17, N. Y.

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Educational Value of Materials Handling Show

A LARGE majority of business and industrial executives are unacquainted with current developments in materials handling equipment despite the fact that materials handling is one of the few fields in which cost reduction can be accomplished. This fact was made evident in a study of the third Materials Handling Exposition held in Philadelphia last January. A survey of visitors to that show revealed 86.6% found equipment displayed which was valuable to their company but which they had not known about before.

This unprecedented study, the most comprehensive and penetrating inquiry ever made in the field of industrial expositions, was made by the research firm of Elmo Roper, for Clapp & Poliak, Inc., exposition management firm, and the American Society of Mechanical Engineers.

"Ninety-five per cent of the visitors said they found equipment at the show of value to their companies," a preface to the report states. "Eighty-six per cent of all the visitors to the show say they not only saw equipment of value to their companies, but saw equipment they had not known about before. Seventy-four per cent say they plan to buy equipment as a direct result of the show. Yet only 54% said they went to the show with the idea of looking at specific equipment."

New Audience

The survey revealed that two-thirds of those who attended the Philadelphia show were a "new" audience in that they had not attended the 1948 exposition in Cleveland. Of the total audience, 95% stated that they had come to see "new developments" in materials handling, while 28.5% came to get an answer to a specific question, and 18.1% to attend one or

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more of the technical sessions. (Some came for more than one purpose, thus bringing percentage totals to more than 100%.)

The exposition, which grew in three years to one of the three largest annual industrial shows in the country, drew its attendance from a wide cross section of American industry and indicated that business executives in all fields are giving added attention to handling problems.

A principal purpose of the study was to provide an accurate gauge of audience quality and interest at industrial expositions. The study covered 36 states and Canada.

Indicative of the fact that many business executives are not fully acquainted with the materials handling field was the fact all but a small percentage saw some equipment at the show which was useful to the company represented but new to the visitor at the show.

The survey conducted by Mr. Roper was done entirely by mail and sent to 10,164 visitors. This total included every visitor except those who attended as exhibitors, their representatives, local college and high school students, etc. A total of 2,842 replies were received on which the foregoing tabulations were based.

The complete study may be examined by writing Clapp & Poliak, Inc., 350 Fifth Avenue, New York 1, N. Y.

Accidents in Agriculture

ON CALIFORNIA farms, a worker meets with a disabling accident every 10 minutes of the working day, according to Ray B. Wiser, President of the California Farm Bureau Federation, in the June issue of the "California Safety News."

Statistics reveal that 13,407 farm hands were disabled and 54 killed in California last year. To these casualties must be added the accidents occurring among self-employed farmers and their families. The combined total would probably be doubled. If this trend continues, one out of every 29 farmers will have a serious accident this year, states Wiser.

According to the U. S. Department of Commerce, farmers lose 9 per cent of their gross income from accidents. This means that the average California farmer pays approximately $972 for accidents each year. Wiser points out that the one way to earn a profit out of accident prevention is through a reduced compensation insurance premium. Good safety records can save as much as 40 per cent of the premium.

"To date, we have been doing excellent accident prevention work through the safety committees of the Farm Bureaus," says Wiser. "But as long as farmers and their help are being injured and killed, we still have work to do. Accident prevention saves money, and is one way to cut the cost of food and increase farm profits."

New Respirator Goes Underground

MORE than 1200 Consolidated Edison Company emergency men and gas and electric production station personnel serving in the Metropolitan New York area have now been trained in the use of a new type gas mask that was developed during the war for U. S. Navy fire-fighting teams. The mask is used when workmen have to enter areas where there is a lack of oxygen or where the atmosphere contains poisonous or suffocating gases.

The Consolidated Edison System purchased 179 of the masks after special tests by the utility's research laboratory engineers and chemists were conducted. The apparatus previously had been approved by the U. S. Bureau of Mines. It was kept a military secret during the war. It is the only respiratory protective equipment that generates its own oxygen supply for the wearer. It permits rescuers to remain for 45 minutes in an area that has an oxygen deficient atmosphere.

Consolidated Edison has installed the masks as regular equipment on emergency trucks and has made them available for servicemen working under hazardous conditions. In addition, they are kept as standby equipment for firefighting and rescue work in generating stations.

Weighing only 13½ pounds, the apparatus is self-contained and permits freedom of movement in smoke or gas filled places. The facepiece has large lenses for full visibility. The unit is described as being comfortable to wear and handier to operate because there are no high pressure cylinders, valves, or fittings.

In Consolidated Edison's training program, trainees are instructed in the working parts of the apparatus and its circulatory system, and they practice donning the harness and facepiece. The wearer inserts the chemical canister in the assembly, automatically breaking its air tight seal. Natural breathing then sends the exhaled breath through an "Exhalation tube" into the chemicals, and moisture liberates fresh oxygen which flows through a neoprene bag that acts like a lung into the "Inhalation tube." (To start the flow of oxygen from the canister it should be kept at a temperature above freezing. Once started it will operate in temperatures far below zero degrees Fahrenheit. Preferably the apparatus should be stored and put on in temperatures above freezing.)

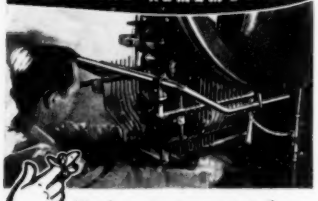
Each trainee wears the equipment until he is completely versed in its use. He also wears it in a room containing sulphur fumes so he can get experience operating it in a gaseous atmosphere. Under heavy exertion the oxygen supply lasts at least 45 minutes and when this pre-determined time limit has been reached, a bell on the device rings, warning the wearer to return to fresh air. Canisters can be easily replaced.

In charge of the program for Consolidated Edison are T. J. Shaughnessy, Manager, and J. A. McCarthy, Assistant Manager of the Department of Resuscitation

A Consolidated Edison Company employee demonstrates freedom of movement given wearers of a new type oxygen mask that the company's emergency men and gas and electric production station personnel now have available for use in oxygen-deficient atmospheres. More than 1200 of the company's personnel have been trained in the use of the mask, which was developed during the war for U. S. Navy fire-fighting teams and generates its own oxygen without any outside connections.

WHEN HE FORGETS...

THE GUARD REMEMBERS!



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If you would like the facts about Junkin Safety Guards, write us. There's no obligation.

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and Related Matters. Training will continue until all of the system's electric and gas emergency men and gas plant employees have been instructed in the use of the new respirator.

Picture by courtesy of Mine Safety Appliances Company.

New Chemical Data Sheets

THE Manufacturing Chemists' Association has announced the publication of four new Chemical Safety Data Sheets in the series prepared by their organization. The new chemical product safety manuals are SD-28 on Phosphoric Anhydride, SD-29 on Ethyl Ether, SD-30 on Sodium Cyanide, and SD-31 on Acrylonitrile.

The manuals for these four chemicals set forth clearly the important physical and chemical properties of the product; its usual shipping containers and methods for their unloading and emptying; container storage and handling; and recommended personal protective equipment. Health Hazards and Their Control are covered authoritatively in a section prepared by the Medical Advisory Committee of the Association.

Persons desiring copies of any of the data sheets should include remittance (20¢ per copy) with their orders to the Manufacturing Chemists' Association, 246 Woodward Bldg., Washington 5, D. C.

Oil-Fire Movie

"EMULSION Extinguishment of Oil Fires with Water Sprays" is fully demonstrated with spectacular fires in full color, and a running commentary with explanation of how and why it works in scenes photographed through the microscope for a 16 mm., *sound*, Kodachrome film, announced for distribution by Grinnell Company, Inc. of Providence, R. I.

Available for free showing before engineering groups, schools, fire protection organizations, fire departments, oil refinery executives, electrical and power utilities, etc., the film presents for the first time a complete summary of the results of fifteen years of pioneering and successful accomplishment in putting out oil fires with water. The method gives protection against flash-back of fires in medium and heavy oils and quick extinguishment of fires in the light oils including kerosene.

The film runs approximately 20 minutes at sound speed and showings may be scheduled for groups having 16 mm. sound projectors by writing to General Sales Manager's Office, Attention: K. P. Jones, Grinnell Company, Inc., Providence 1, R. I.

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N. J. Safety Award

THE New Jersey State Safety Council has announced the inauguration of the Thomas Roy Jones Award, to go to voluntary associations and organizations throughout New Jersey which conduct the most effective statewide safety education program each year. It is named for the president of the state safety council, who is also president of ATF Incorporated, parent firm of a group of manufacturing companies in the printing equipment, household furniture and electronics instrumentation fields.

The award will be made on the recommendation of a committee of judges to consist of the president of the National Safety Council, the president of the American Society of Mechanical Engineers, the Governor of New Jersey, and an officer of the New Jersey Safety Council.

Factors which will be taken into consideration in making the award will be the number of persons reached by the association involved; the importance of the objectives of its program in the accident prevention field; the importance of the program in the organization's activities, and the media used and results achieved.

City Fire Defenses Weaken As Hazards Increase

WHILE fire hazards are increasing almost daily, the fire defenses of many American cities are "seriously under-manned," the National Board of Fire Underwriters reported at its annual meeting at the Hotel Commodore, New York City.

Use of new materials and new processes by manufacturers has increased the danger of fire by the introduction of nearly one hundred "special hazards, peculiar to our present era of advanced technological development," the National Board's Committee on Fire Prevention and Engineering Standards pointed out.

At the same time, fire departments in many cities are "seriously under-manned" because firemen's hours on duty have been shortened without any provision being made for hiring additional men.

Among the special hazards studied by engineers of the research division during the past year was that involved in handling and transporting ammonium nitrate, which exploded in Texas City in 1947, causing 551 deaths. Two large-scale field tests of ammonium nitrate handling were made in cooperation with other interested government and industrial organizations.

Special arrangements have been made for routing of this chemical to designated loading and shipping points where proper care can be exercised to prevent another Texas City disaster. First-hand inspections are made at these points to detect any violations in handling and shipment of ammonium nitrate, which is a popular material for use in fertilizer.

Other problems studied by the engineers ranged from the hazards of plastic ornaments used on Christmas trees to the hazards involved in the production of nuclear power.

They considered the hazards of "mass-fogging" with DDT, the combustibility of foam rubber which is now widely used in upholstery and mattresses, and the question of whether carbon dioxide poisoning is a factor in airplane crashes.

Another industrial hazard considered was the proper handling of perchloric acid, which caused an explosion in Los Angeles in 1947 resulting in 17 deaths. At the time of the explosion, it was pointed out that improper handling by an unqualified man had been responsible for the explosion.

Engineers also studied portable oxygen production units for hospitals, control of smoke odor damage with synthetic deodorants, failure of tempered glass door panels, the xylene vapor wood drying process, and many other problems.

While expressing concern over inadequate fire defenses in many cities, the National Board pointed out that others have taken positive action to improve their fire protection. Special mention was made of the city of Billings, Mont., as "a shining example of what can be done through constructive work."

Billings once had a very bad loss record, the engineers said, and "several years ago the Mayor requested advice on a general reorganization plan. This plan has been conscientiously carried out."

The fire department has been strengthened by adding new men, constructing a new fire station, improving the existing fire stations and the purchase of new equipment. The fire alarm system has been rehabilitated, a new water supply main has been installed, and the training program for firemen expanded, with fire prevention methods "greatly improved," the National Board reported.

The NBFU Suggested Fire Prevention Ordinance has now been adopted by 132 municipalities located in 34 states, and is under

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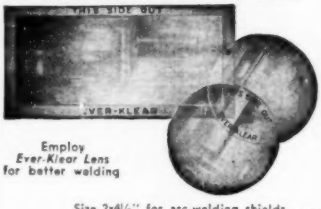

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consideration by nearly one hundred other cities, the Committee said.

The States of Massachusetts and Iowa are now trying to develop a single code which will embrace all fire prevention and protection laws, and Georgia has adopted a far-reaching fire safety law giving broad powers to a State Fire Inspector.

For the forty-fifth year, the National Board sent specially trained engineers to various cities to make thorough inspections of their fire fighting facilities. Among the larger cities inspected were Miami, Fla., Fort Worth, Texas, New Orleans, La., San Francisco, Cal., and Philadelphia, Pa.

Safety Program at Refinery of Continental Oil

IN RECOGNITION of almost two million accident-free man hours turned in by Continental Oil Company's Ponca City, Okla., refinery employees in the Light Oil Grease Plant, and Solvent Units, a presidential citation dinner was held June 23rd in the Continental cafeteria. A similar dinner was held on July 1st, for shift workers who were unable to attend the first dinner June 23rd.

Approximately 200 persons attended when President L. F. McCollum, principal speaker, presented presidential citation certificates to the Light Oil Division represented by 89 men with 890,903 noninjury man hours, and to the Grease Plant and Solvent Units, represented by 80 men with 914,055 noninjury man hours.

The long safety record of the Light Oil Division and the Grease Plant and Solvent Units in the Lube Oil Division totals over five years in man hours without the loss of time due to accidents.

Continental recently inaugurated an incentive safety program, developed by the joint employer-employee Safety Committee of the Ponca City Refinery.

For the purposes of competition and in making recognition of outstanding safety attainments, the refinery personnel has been divided into 14 zones. Dinners at company expense are to be given to zone groups on completing accident-free periods, beginning at 200,000 noninjury man hours, and at intervals of 400,000 man hours, 700,000 man hours, and 1,000,000 man hours without lost-time accident.

When a zone group completes one million accident-free man hours, besides a dinner given for the employees and their wives, a cash award will be made to each employee along with a membership card in the "Million Man Hour Club." As a further incentive toward safety, each month the safety committee will provide a safety contest topic and award as a prize approximately $12 worth of clothing to the winning employee.

The Safety Committee, through the cooperation of management and employees have been responsible for a 60% decrease in lost-time accidents for the first six months of 1949 over the same period of time in 1948. Their slogan is "The Cleanest Refinery—why not the Safest"!

In coverspecs or regular models. For chippers and grinders as well as welders.

Eyegard "Champions" have 10-way ventilation!

Eyegard "Champions" are easier on the eyes . . . help your men to work steadier with less "time out." There's extra comfort in them because the superlight plastic is molded to form-fit the face . . . extra protection because the goggles are impact-resisting . . . extra ventilation through three large vents at side of cup and seven additional vents around the lenses. Cool and fog-free. With all these superior features, they cost you no more than ordinary goggles. Next time you order—get Eyegard "Champions"!

Write for free catalog of Eyegard Equipment . . . it will save you money.

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A FREE, sturdy, easy-to-erect, shoe display. As a further step in its program to get more workers to wear safety shoes, the Hy-Test Division of International Shoe Company is making available to its customers this handy safety shoe displayer. It is designed specifically to encourge workers and prospective wearers to handle and to examine the shoes for quality, construction, etc. It also enables him to compare the different styles of shoes and select the one best suited to his job. The shoe company will furnish this displayer free-of-charge to its customers on request.

LEARNING THE

HORSEPLAY

ONE of the latest examples of horseplay, is the worker who was given a glass which supposedly contained water by a repair woman with whom he worked. The glass, he discovered, contained not water, but carbon tetrachloride, which could have been fatal if he'd got enough of it.

VAPORS IGNITE

THE shaft on a centrifugal pump broke and the broken end blew out releasing a large volume of hydrocarbon vapor to the atmosphere in the still area. Though the stillman and his helper attempted to shut down the operation, the blanket of vapor ignited and both men were fatally burned. Personnel had been cautioned to immediately evacuate area in a case of this kind, but both men stayed in area to shut down pump. While the accident itself was apparently due to mechanical failure and may or may not have been prevented, the men's lives may have been saved by prompt action on their part.

ELECTROCUTION

A JIG man was using a resistance welding machine to repair a damaged jig flume. During work his clothing including his welding gloves had become wet. He used a permanently installed machine with cable and reel to reach the jig flume. The switch was turned on and he went to the flume having only a very narrow working area to make repairs. He connected the electrode with the holder and received a severe electrical shock which resulted in his death. Many things were wrong here, though the hazard of the dampened clothing would have been lessened had other than an electric welding apparatus been used. Also, since the working area was cramped, the job was rendered more difficult.

INJURED BY TRUCK

AN ELECTRIC truck was being repaired, the repairman sitting on the floor as he worked. A fellow worker passing by stopped to speak to him, and rested his arm on the controls of the truck, which immediately started up and ran over the repairman's foot. It is recommended that in making repairs on electrical trucks the source of power be blocked off to avoid accidental starting.

RING FINGER LOST

THE practice of wearing rings while working, results in too many finger accidents and amputations to be passed over lightly. A recent accident occurred when a trucker, after unloading the back of his truck, started to jump to the ground. A ring on his finger caught on a projection, and the finger was so badly mutilated that it was necessary to amputate.

HARD WAY

SOLVENT FIRE

A PRINTING press operator was attempting simultaneously to draw low-flash solvent from a drum and attend to a machine. The solvent overflowed onto the concrete floor. After employees had wiped up most of the liquid, the operator of a near-by press started the motor and a flash fire followed. A nearly empty drum ruptured, spreading the fire. Three sprinklers operated and employees completed extinguishment with carbon dioxide units. They then promptly dried and oiled the machinery. Thousands of printed forms were wet down.

Drums of flammable cleaning solvents should not be kept in manufacturing areas. Limit the quantity to a day's supply, and keep it in approved safety containers.

OILY FLOOR

GARAGES are more likely to be oily than other places, and for this reason special caution should be taken to see that spills are wiped up or a good oil absorbent is used. A truck driver recently stepped to the garage floor from his truck bed, skidded in the oil, and wound up in the hospital with an injured spine.

SAME OLD STORY

IT SEEMS elemental to suggest that care be exercised in handling gasoline near a flame, but disregard of this safety measure continues.

The vice president was using a gasoline-saturated chamois for cleaning purposes. He accidentally got it too close to an open flame and it ignited. He dropped the flaming chamois and it fell into a can of gasoline which ignited and enveloped him in flames.

A quick-thinking employee tackled the V-P, threw him to the floor and smothered the flames with his coat.

The V-P will recover from severe burns about the body and his rescuer should get a medal and a raise.

POOR PILING

HAPHAZARD stacking of materials, especially odd sized or shaped materials frequently results in accidents when the materials refuse to stay stacked. A foundry employee was standing in a cleaning room conversing with a fellow worker, when a large casting tumbled down. It struck a smaller casting which in turn caused a length of steel to fly up and come down on the man's head, splitting open his scalp, from forehead to the back of the head. While this is somewhat of a freak accident it does show the danger of poorly stored material.

LOOSE GLOVES

WHILE guiding sheet metal through a roller, a worker's gloves were caught by the roll and his hands were dragged into the roll and severely mangled, several fingers being severed. When protective gloves are worn care should be taken that they are close fitting, and have no loose finger tips for other parts, which may be caught in moving machinery.

New Safety Guide For Woodworking

"YOUR Guide to Safety in Woodworking Shops," thirty-third in a series of safety booklets that slip in the pocket for easy reference, has just been published by the Accident Prevention Department of the Association of Casualty and Surety Companies. Thirty-two pages are crammed with specialized safety information, ranging from the proper use of woodworking equipment for the guidance of the mechanic in a large commercial shop, to tips for handling small tools that will help keep the home hobbyist safe and sound.

The booklet contains sections on general safety including correct work clothing, lifting techniques, etc., good housekeeping in the shop, the proper care and use of hand tools and of woodworking machines, such as circular saws, jointers, drills, mortising machines, planers and lathes. Other sections deal with ventilation, the related hazards of fire and explosion, and brief reminders for safety off the job. Of particular interest to amateurs and those with their own work shops are the pages on use of hand tools. Tips are given, for example, on the correct way to drive a nail without mashing a finger, and on replacing the "mushroomed" heads of chisels or punches before chips can flake off and perhaps imbed themselves in the flesh.

Copies of this attractive and useful booklet are available through member companies of the Association and their agents. Single copies may be obtained by addressing: Association of Casualty and Surety Companies, 60 John Street, New York 7, N. Y.

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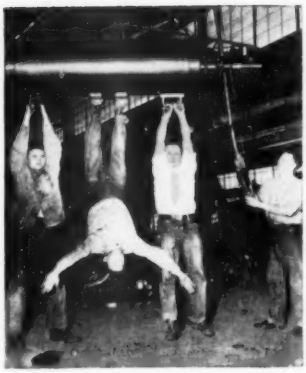
New Magnetic Pulley

WHAT is believed to be the world's largest magnetic pulley employing Alnico, designed and constructed by Dings Magnetic Separator Co., Milwaukee, Wisconsin, was recently shipped to the Pennsylvania Glass Sand Corp. at Hancock, W. Va. It will be employed here to remove iron impurities from sand used in the manufacture of glass, an important process since iron impurities would be likely to cause the glass to contain blue and green streaks which label it as lower grade.



Specifications

The pulley is 24 inches in diameter and 60 inches wide. Its weight of 2,200 lbs. includes 1,500 lbs. of Alnico, the largest amount ever used in a piece of equipment, according to Dings executives.

A permanent magnet (no external energization from direct current power supply is needed), the Alnico casting is magnetized by heavy currents of short duration reaching peaks in the vicinity of 100,000 amperes. After complete magnetization, the pulley is ready for operation with no subsequent loss of magnetism.

Alnico, a General Electric development, is an aluminum, nickel, cobalt, iron alloy of permanent magnetic stability constant to within a few hundredths of one per cent per century when properly manufactured. Its energy content after magnetization is rated at 10 to 100 times greater than that observed in so-called permanent magnets of a few decades ago.

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Avoid costly accidents caused by slipping on oily or greasy floors! Reduce fire hazards! Replace sawdust or wood shavings with Fuller's Earth. Every shop and industrial plant where machinery is present needs this low-priced safety aid.

Fuller's Earth *absorbs* oil and grease — and it's non-inflammable. Write for FREE SAMPLE or trial order at quantity price.

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Distract Insects

EVEN insects have allergies. And lucky for us they do. Because 85% of all night-flying insects find certain light-waves obnoxious, one can now be outdoors in comfort while insects swarm at a distance . . . and keep their distance. All one needs to assure this comfort is an insect repellent light bulb which can be installed in any light socket. While the light of these bulbs is pleasing to the human eye, those myriads of buzzing moths, gnats and other night-flying pests will shun the area completely.

Mosquito welts, painful infections and even the very real danger of fatal diseases will no longer be hazards for those working in the open or seeking a breath of air at night. Of course, it is necessary to stay within the charmed lighted area to enjoy such sanctuary. However, since these insect repellent bulbs come in a complete size range from 25 to 1500 watts, a size can be found suitable for each "protected area." Gas stations, road-side stands, factory entrances and open-air car lots equipped with these bulbs will be free of stinging and annoying insects.

Government entomologists estimate that insects will cause two billion dollars' worth of damage during the year 1949, mostly during the summer season. This huge figure covers material loss and the costs of death and sickness from insect-borne diseases such as cholera, tuberculosis, typhus, dysentery, and even dread polio or infantile paralysis. One common housefly alone can carry millions of germs on its feet and body, transmitting them to the individual.

New Manager For American Industrial Safety Equipment Co.

MR. JOHN E. FEESER of Cleveland was appointed general manager of the American Industrial Safety Equipment Company located at 847 Lexington Avenue, Brooklyn 21, New York. Mr. W. H. Loveman, president, announced the change recently. The American Industrial Safety Equipment Company has moved to larger quarters to accommodate customers on the East Coast.

Mr. Feeser was purchasing agent for the Burdett Oxygen Company of Cleveland, Inc., one of the largest independent producers of industrial gases in the country. In addition to the manufacture of industrial gases Burdett manufactures welding equipment and supplies for national and export sale and is distributor for General Electric arc welders and specialties in their territory.

The American Industrial Safety Equipment Company is a wholly-owned subsidiary and are manufacturers and distributors of safety equipment such as goggles, helmets, lenses, gloves, respirators and other supplies used in the field of welding for both national and export sales. Mr. Feeser joined the Burdett Oxygen Company of Cleveland in December, 1946 after leaving Harrisburg Steel Corporation, located in Harrisburg, Penn., where he was purchasing agent.

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Men are safer . . . accident hazards are fewer. GOLD MEDAL Junior Safety Swinging Scaffolds provide extra protection. They're easy to handle and simple to install. Steel wire rope replaces dangerous rope block and falls. Positive lock on mechanism eliminates danger of faulty hitches.
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Ansul on West Coast

BY MUTUAL agreement Ansul Chemical Company of Marinette, Wis., will offer sales and service for Ansul Dry Chemical Fire Extinguishers in the Pacific Coast states, formerly served by Snowden Chemical Company of Modesto, Calif.

This change in the distribution of Ansul fire extinguishing equipment was effective June 16. Ansul has opened West Coast offices in Los Angeles, Fresno and Oakland.

Robert E. Sexmith, a veteran fire protection expert, has been named West Coast Manager, Fire Extinguisher Division. Sexmith will be located in Los Angeles.

B R E C K

Breck pH7 Protective Cream

Breck pH7 Protective Cream protects a worker's hands. Applied before the day's work, it helps to keep the skin free of irritation. Workers who handle industrial irritants will find that hands are easier to clean after the day's work. Hands in good condition do a faster and better job.

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industrial Hygiene

ASSOCIATE EDITOR
JACOB A. GOLDBERG, A.M., Ph.D.

Tuberculosis in Industry

INDUSTRY, because of the closely knit character of its organization—both as to labor and management—plays an important social part in the progress made toward eradication of tuberculosis. By protecting its employees from a costly disease, industry has been of great service to the community.

These were some of the conclusions drawn in a panel discussion on Tuberculosis in Industry, held in connection with the 13th annual meeting of the Industrial Hygiene Foundation at Mellon Institute, in Pittsburgh. The five panel papers have been published as Bulletin IX in the Foundation's Medical Series. They are:

"Mass Case Finding Surveys in Industry—Role of the Plant Physician," by Dr. Herbert R. Edwards, executive director of the New York Tuberculosis and Health Association; "Tuberculosis Among Industrial Workers—Viewpoint of the Sanitorium Physician," by Dr. C. Howard Marcy, medical director of the Tuberculosis League Hospital, Pittsburgh, and member of the medical committee of the Industrial Hygiene Foundation; "The Placement of Workers in Industry, Particularly Ex-Patients," by Dr. S. D. Steiner, medical director of the Oldsmobile Division of General Motors Corporation, Lansing, Mich.; "The Workingman's Chief Concern When He Develops Active Tuberculosis," by Dr. Leo Price, medical director of the Union Health Center, New York; and "The Compensation Aspects of Tuberculosis in Industry," by Harry A. Nelson, director of workmen's compensation, Wisconsin Industrial Commission.

50,000 Deaths a Year

While there has been a tremendous decline in tuberculosis mortality, indicating an even further drop, there are still 50,000 deaths from tuberculosis each year, and an incidence of well over 500,000 cases, many of which are not known to the community. These figures, Dr. Edwards states, constitute a problem requiring constant supervision, particularly by a plant physician. The problem is further accentuated by shifting populations and migration into the country of persons from areas with high tuberculosis rates.

Tuberculosis is still a serious problem in large industrial communities, and the objectives in control should be twofold: first, to find the case, and secondly, to set up safeguards to prevent the spread of infection.

While tuberculosis can logically be considered a responsibility of government because it is a chronic communicable disease of long duration, it is, in addition, everybody's business, and government responsibility for control does not release the individual, industry, or organizations and agencies from contributing their part in carrying out a detection and control program.

Living Conditions Disease Factor

While tuberculosis is found more frequently in semi-skilled or unskilled labor groups, it is in the main not an occupational disease, Dr. Marcy believes. He emphasizes that the incidence of the disease is more dependent on the level of living conditions than on the work in which the individual is engaged.

In industrial urban centers it can be demonstrated that about 75 per cent of the adult population has been infected. Fortunately, all those who become infected do not develop the disease in clinical form.

It must be remembered, Dr. Marcy concludes, that tuberculosis is communicated by coughing or sneezing, and in public health practice the contact between the sick and the well must be broken if tuberculosis is to

be treated effectively.

Inactive tuberculosis presents no segregational problems, according to Dr. Steiner. In the Oldsmobile Division of General Motors, persons with inactive tuberculosis are allowed to work on any job in the plant, including grinding, spray painting, plating, and other areas where nuisance problems may exist. However, such workers should not be exposed to a silica hazard or be placed on heavy work.

Job Loss

The workingman's chief worry is the fear of losing his job, and he looks upon tuberculosis as a chronic disease which will disable him for a long period of time. For this reason, Dr. Price stated, certain sections of the labor population have resisted mass X-rays, particularly those who have no inkling how to cope with the disease, or what protection would be afforded them economically in the case of disability.

To establish tuberculosis control, members of the International Ladies' Garment Workers Union developed a tuberculosis benefit program in 1913. The 200,000 worker industry now has an ambulatory clinic providing as many as 2,000 medical services daily. Employers provide funds assuring tuberculosis victims of hospital benefits, sanatorium beds, $300 to $500 in cash plus income for 13 weeks, and a job when they are well enough to return to work. They remain under continuous medical supervision for three years thereafter.

Tuberculosis is being conquered, Mr. Nelson stated, and industry has played an important part in the progress made so far. Industry has voluntarily helped, under various insurance and workmen's health plans, to a much greater degree than was ever contemplated when the workmen's compensation act was passed in 1911.

Copies of Bulletin IX, entitled "Tuberculosis in Industry," may be obtained from Industrial Hygiene Foundation, 440 Fifth Avenue, Pittsburgh 13, Pa. There is a charge of 50 cents to cover actual cost.

New Hazards Need Control

WITH the hazards of this chemical age no longer looming as possibilities of the future but beginning to take shape as facts of the present, farsighted safety experts are already surveying the dangers caused by new materials in industrial use and planning ways to deal with them. The Accident Prevention Department of the Association of Casualty and Surety Companies, in line with its objective of studying and calling attention to unusual hazards before they result in accidents, has recently added to its staff a specialist in this phase of safety, according to an announcement by J. Dewey Dorsett, general manager of the Association. S. Charles Rothmann has been named Research Engineer in the industrial division of the department to develop a series of detailed reports on special chemical hazards.

Mr. Rothmann will work with an already-functioning committee of safety specialists of the Association —the Special Hazards Engineering Research Sub-Committee—which is devoted solely to research on hazards that are developing in industries as a result of the use of new substances and compounds. There has been, for example, a new application of the element beryllium in the manufacture of phosphors used in television equipment, fluorescent tubes, etc. which has recently proved to be toxic in effect and a threat to the health of workers unless its dangers are known and safeguards developed.

Information Series

The report series, which will deal in complete detail with such hazards, is a further extension of the Association's accident prevention activities and will be available to member companies to assist them in providing safety engineering service to assureds. It will eventually become an encyclopedia of information for insurance engineers, underwriters and other casualty specialists on the effect of certain chemical hazards on products liability, boiler and machinery, and workmen's compensation coverages.

Mr. Rothmann, editor of the book "Constructive Applications of Atomic Energy" just published by Harper and Brothers, has made significant contributions to the field of industrial hygiene and safety engineering, both in civilian life and during his army career. He served in the Army with rank of major.

General Ventilation

IN EVERY plant general ventilation is required to achieve a healthful and invigorating working environment and to induce a feeling of comfort among employees warns the "Industrial Health Bulletin" of the Canadian Dept. of National Health and Welfare. In plants where the manufacturing process generates toxic substances which contaminate the workroom air, additional ventilation measures such as local exhaust ventilation are needed. For many plants, however, where only minor sources of air contamination prevail, general ventilation is sufficient to maintain adequate standards of air temperature and purity.

Summer Problems

During the winer months the average speed of air movement in the ordinary factory is generally about

30 feet per minute. In summer more rapid movement is highly desirable. Outdoors in warm weather we find a breeze very refreshing. Indoors, too, a good rate of air movement is invigorating while a stagnant atmosphere is oppressive and causes a feeling of stuffiness. In summer, especially, full use should be made of ventilation facilities so that a refreshing atmosphere can be assured. The provision of adequate air movement is of great importance in the maintenance of body comfort, particularly for persons working in hot, humid conditions. At the same time, uncomfortable drafts should be avoided, especially if the temperature of the draft causes a rapid change in room temperature.

There are two types of general ventilation—natural and mechanical. The latter term is used when mechanical power operates fans which force air in or out of a building. In natural ventilation, no mechanical power is used and the ventilating power of natural forces is employed. These are the force of gravity and the motive force of the wind.

Narrow factory buildings can generally be satisfactorily ventilated by means of well designed and suitably placed windows. However, many workrooms, especially in extensive single-story factories, cannot be satisfactorily ventilated by natural means. Correctly planned systems of mechanical ventilation are necessary in such cases. The technical aspects involved in designing an efficient mechanical ventilation system demand the services of a ventilation engineer. The initial provision of a competent design will pay dividends in preventing subsequent failure or breakdown of the ventilation system.

Manual on Toxic Eye Hazards

THE Joint Committee on Industrial Ophthalmology of the American Medical Association has recently announced that the Manual on Toxic Eye Hazards prepared by the Joint Committee and published by the National Society for the Prevention of Blindness is now ready for distribution. It has been two years in preparation and contains the following material:

Chapter 1. a) Standards and Tests for Eye Protection Equipment. L. Banet, Ph.D., and J. M. McGreevy.

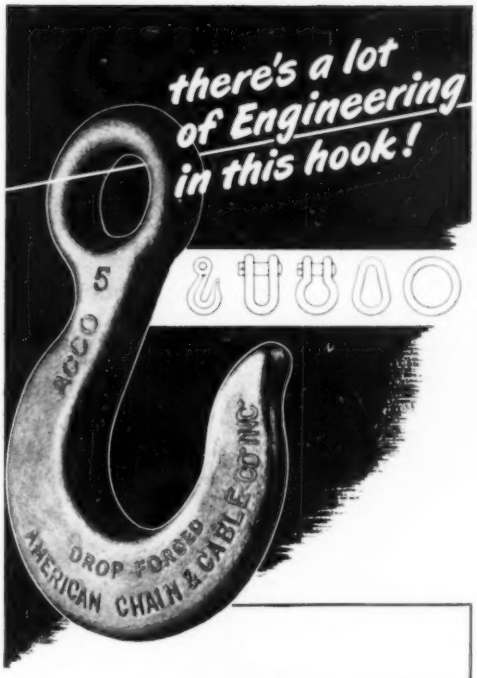
b) A Well Organized Eye Protection Program. Ralph S. McLaughlin, M.D. and Thomas A. Walsh.

Chapter 2. Tables of Toxic Chemicals. Prepared by Prudence M. Van Arsdell, B.A., M.A.

Chapter 3. Emergency and First Aid Procedures in Chemical Eye Injuries.

References for Additional Reading.

There are ten illustrations and five tables. The price of the Manual (Publication 494) is $1 and may be secured direct from the National Society for the Prevention of Blindness.



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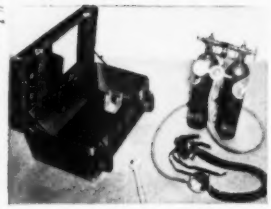

When emergencies requiring oxygen treatment arise, you'll have an effective, *low-cost* way to deal with them if a portable Scott *Demand* Inhalator is part of your first-aid equipment.

The new Scott *Demand* Inhalator supplies oxygen as "demanded" by the patient, with constant flow also available. Easy to use—no adjustments required.

Initial cost of the Scott *Demand* Inhalator is low, and its principle of *"demand"* flow makes it economical in use, as well. Produced by the makers of famous Scott *Air-Pak* Safety Breathing Equipment.

TYPE A—basic unit, including yoke and 6 ft extension hose. **$96.00**

TYPE B—as illustrated, including carrying case, but without oxygen cylinders. **$147.50**

See your Scott *Air-Pak* distributor, or write for full information in Bulletin 538—*today!*

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Suspension Heaters

FOUR suspension-style, forced-convection-type unit heaters installed in the Unit Well No. 8 pumping station of the City of Madison, Wisconsin, have for more than two years given that station dependable, economical service.

The heaters are used during winter months to maintain a 40 F to 50 F temperature inside the unit well when the pump motors are not in operation—mostly between 10 p.m. and 6 a.m. When the pump motors are operating, they generate sufficient heat to maintain the room at the desired temperature.

During a recent three-month winter period when the pumping station was not in use, the unit heaters were in constant operation 24 hours daily, seven days per week. The average cost of this operation was approximately nine dollars per day for the full 28-kw heating load (772 kwh per day at $.012 per kwh).

Unit Well No. 8 is a modern, unattended, automatic pumping station supplying chlorinated well water to residential and commercial consumers in the northeast section of Madison. At present, the station is operating 16 to 18 hours daily with a normal load of 2,000,000 gallons. It is designed, however, to handle 3,400,000 gallons per 24 hours.

The four suspension-style heaters include a 3-kw unit which heats a repair shop; a 5-kw unit heating a chlorinating and analysis equipment room; a 7.5-kw unit in the room with the turbine pump motor; and a 12.5-kw unit in the room housing the booster-pump motor, switchgear, and unit substation. Each of the heaters is mounted on the wall so that warm air is circulated throughout the room. The heaters are wired to individual panels in the control substation and are thermostatically controlled.

"Since the pumping station is built in a public park adjacent to a residential section," said L. A. Smith, the city's Superintendent of Waterworks and Sewerage, "we could not use a conventional type of heating plant because a smokestack would be undesirable in this area. To meet this situation, we adopted the suspension heater, which solved the problem, as our experience has been that this type of heater is both reliable and economical."

Picture by courtesy of the General Electric Company.

Unit heater suspended from ceiling of booster-pump house.

Atomic Energy Book

OF GREAT interest to the industrial, insurance, or engineering executive who wants to be informed on the potential usefulness of atomic energy in a peacetime economy is the recently published "Constructive Uses of Atomic Energy." The book appeared on the stands July 13 and is published by Harper and Brothers. Its editor is S. C. Rothmann, a research engineer on the staff of the Accident Prevention Department, Association of Casualty and Surety Companies, and an authority in the field of industrial hygiene and safety engineering.

Written for the layman in non-technical language, the volume contains discussions by fourteen eminent scientists, such as Arthur H. Compton, internationally-known physicist and Nobel prize winner and C. P. Rhoads, an authority on cancer research. The articles describe the everyday usefulness of atomic energy in

such fields as industrial power, aviation, ceramics, and chemical, biological, medical and pharmaceutical research. The subject matter, in itself exciting to all thoughtful minds, is illustrated by photographs and drawings that still further illuminate the tremendous potentialities of atomic energy for good as well as evil ends. For the non-scientific reader there is an extremely useful glossary, defining in easily-understood terms the new words and phrases nuclear energy has added to the English vocabulary. A selected bibliography lists recent publications as a guide to further reading in the field.

Solvent Hazards

INTERMITTENT or occasional jobs involving the use of volatile solvents require as rigorous safety precautions as continuous operations, if substantial quantities of solvent or periods of time are involved. This warning was recently issued by the Safety Research Institute.

This was demonstrated recently in connection with the removal of grease from a conveyor belt. Brushes dipped in solvent in open buckets were used for the purpose and the men doing the job would have to bend forward to reach across the belt and thus bring their faces close to the surface being cleaned. About 10 to 12 gallons of solvent were handled in this manner in a period of about 3 hours. This procedure had been followed many times, on an average of once every 3 or 4 weeks, without apparent difficulty.

After one such session, however, when three men did the work, two of the men became ill. One recovered in about six weeks but the other died as the result of injury to the kidneys from the inhaled solvent vapor. The third man suffered no illness.

As may be seen from this accident, absence of difficulties on a solvent-using job is no assurance that the procedure is safe. When operations are carried out intermittently, the effects of improper handling may not become evident immediately.

Typical intermittent operations which require suitable precautions include tank cleaning, cleaning of machinery, removal of paint from walls of spray booths, sludge removal from degreasing machines, etc. The nature of the solvent employed will determine whether safeguards against both fire and health hazards are needed.

If it is impractical to provide mechanical ventilation for intermittent operations, workers should be protected from inhalation of the vapors by respirators approved for the type of solvent and the circumstances involved. Skin contact may be prevented by the use of solvent-resistant gloves, protective creams and aprons. The solvent should be kept in closed containers labeled with the necessary precautionary information and workers should be informed of the dangers of improper procedures.

SAFE-T-NEWS

Metal Surfaces Made Safe With Non-Slip Beads

New Vibrator Welding Tool Builds *Fully Slip-Proof* Surfaces on Worn Stair Treads and Walkways

No More Slipping

Slipping and falling accidents caused by smooth metal surfaces *can now be prevented*. The new RUF-TRED vibrating holder and Special RUF-TRED Electrode deposit file-hard, "*sure-grip*" long-wearing beads on worn or smooth metal areas.

Positive Grip

The RUF-TRED tool applies beads in any desired line pattern for positive protection—criss-cross for large areas—closely spaced parallel lines for stair tread nosings. RUF-TRED beads retain positive gripping qualities even when wet or oily—prevent slipping accidents under all sorts of conditions.

Practical, Easy to Use

Used with any standard AC or DC welding machine. No preparation—deposits hard, porous beads on dry, wet, or oily surfaces. No welding skill required. RUF-TRED tool automatically causes intermittent arcing between the electrode and the metal surface. Easy as drawing a chalk line. No chipping. No cleaning.

Low-Cost

Only 10 cents a square foot for RUF-TRED slip-proofing—including labor, material and power.

Permanent

Wear will not polish beads smooth. The file-hard, "foamy beads" outwear new steel safety treads—retain positive grip even when wet or oily.

For permanent slip-proofing at low cost, use RUF-TRED on your worn safety treads, smooth metal floors, walkways, machine platforms, running boards, stair treads, foot pedals, catwalks, crane and locomotive cab floors, ladders, manhole and trench covers.

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THE INDUSTRIAL Nurse

EDITOR

ROSAMOND J. WEBSTER, R.N., A.M., Ph.D.

Patients as Friends

"PATIENTS should be our friends," writes a leading cardiologist. "The sooner one establishes a sympathetic and friendly relationship with the patient, the sooner will one obtain the necessary information from all the story that can be told; any minor portion of the patient's account may be vastly more important than all the laboratory tests in the world and may save not only time and money, but even misery and death." These lines from the pen of a nationally known specialist spell out a distinct message not only to other clinicians, but also to all who have dealings with the sick and the injured. An industrial nurse, upon whom her fellow workers look with acceptance and appreciation, can do far more for them and for the employer than one who is a negative, high-hatted type of individual, to mention but two of several negative personal traits. The sympathetic and friendly nurse can get an accurate and complete history of an illness, full details of an accident and cooperation in bringing about early recovery and return to work of an ailing or injured worker. Her professional stature is in no way involved in developing a friendly, understanding, inquiring, helpful type of relationship. Her service to the employer and to the employees is enhanced manyfold. Good judgment is as requisite in this relationship, however, as in any other.

Noise and Health

THE effect of noise on production, accident rates, disability of exposed workers, absenteeism, and labor turnover has long been recognized. A special committee concerned with the effects and prevention of industrial noise has recently been organized. Recognition has been taken of the fact that most ears will suffer if the exposure to noise lasts for a considerable period of time. The louder the sound, the greater will the impairment of hearing be over a similar period. The longer the period of exposure to the same abnormal sound levels, the greater is the hearing impairment. It has been found that while all normal ears are probably susceptible to high intensity level sound, they are probably not equally susceptible. The development of noise deafness is slow and insidious. The worker is apt to disregard the situation until he finds he is rather deaf. Certain it is that in some jurisdictions the question of workmen's compensation on an occupational disease basis may be unsolved. It is likewise evident that in many occupations and operations noise is inherent and difficult if not impossible to eliminate. On the other hand, it has been found that some soundproofing may be undertaken; that some noisy processes may be mitigated even if not fully eliminated. Pre-employment and periodic audiometric examinations are recommended. The industrial nurse can readily learn to use the testing apparatus when needed.

Changing Habits

RELUCTANCE to attempt to change habits of workers by educational measures has several bases. "It can't be done"; "Why bother?" "Why not leave well enough alone?", "They feel all right so why get them worked up"—these are several of many reactions that have been expressed when the subject has been presented to industrial nurses and others. But habits can be changed. This is most evident in matters of diet. We have learned to use citrus fruits because of the extensive advertising of orange growers;

we have learned to drink a greater quantity of milk per capita than ever before because of educational measures in schools, high schools, and advertising by health departments, insurance companies, and milk dealers. Let us think back to the huge breakfasts of a few decades ago. Eggs, fish, meat, plenty of pancakes, a lot of butter, syrup, hot breads and all the fixings that went with such a meal. Compare this with the simple breakfast of the weight-conscious young woman and young man of today. Look at the menu of a fine hotel dinner some years back and the far simpler, better balanced and more meager and sensible dinners of the present. These simple comparisons are indicative of the wide gains that health education has already achieved. Much more remains to be done, and to be repeated for the benefit of each new group of workers taken on in an industry.

The Feet First

MANY workers complain more about their feet than about anything else. A business publication has estimated that employees with sore feet cost industry about one hundred million dollars in 1948 through absenteeism and other factors. Some of the large department stores in which many of the workers must necessarily spend much of their time standing and walking, long ago organized foot clinics for the benefit of the workers. These were established as adjuncts to the medical departments. Some large industries have also found it desirable to set up such services, with reported large net savings from this minor disability. Understandably, this may not be possible in many small establishments. But those large enough to maintain an industrial nurse and a medical department might well give thought to this matter. Floor surfaces may play some part; ill-fitting shoes and socks, plus lack of adequate and proper personal care of corns, bunions and other defects and disabilities are in the forefront. Help by a trained person, be it a specially trained industrial nurse, specially qualified member of the medical staff or a part-time podiatrist should warrant the trouble and expense incurred.

Antibiotics

WITH the advent of penicillin, a new era opened up in the matter of treatment of many conditions which did not respond readily to available drugs,

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Company
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Low Cost Comfortable Protection

For extra-durable protective service, safety against leaks or damage by oils, acids or other harmful materials — it pays you to buy the gloves your workers like to wear — Stanzoils.

The black, neoprene-impregnated, canvas G-25 Stanzoils wear extra long in any service. Slip-proof surface aids worker dexterity, gauntlet wrist offers added protection. Stanzoil R-27's in safety red color warn workers when fingers are dangerously near moving machinery. Prevent injury claims — increase your plant's output — insist on Stanzoil Industrial Gloves. Write today for informative catalog.

Synthetic Rubber Division
The Pioneer Rubber Company
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Los Angeles, California

OVER *30 Years* OF QUALITY GLOVE MAKING

STANZOIL BY PIONEER

pharmaceuticals and other substances. Now we have an Antibiotics Study Section of the National Institute of Health. Recent conferences held in Washington indicated how far research in this field has advanced within just a few years. Now antibiotic substances are reported as being available not only from soil bacteria, but also from the sweet potato, the banana, the Indian carrot, hops, and seed plants. Antibiotics from other sources have already been announced as being useful in the treatment of various conditions. Outstanding among these are aureomycin and chloramphenicol. These two drugs, which are now available on the market, are the first antibiotics demonstrated to be effective against certain of the rickettsial and viral diseases—the latter is the first major antibiotic to be synthesized on a commercial basis. The magic of the research laboratory, coupled with the efforts of large pharmaceutical establishments, give promise of great and decisive aid in the elimination of many diseases which heretofore have been the cause of considerable morbidity and mortality. Perhaps at last in the not too distant future, it will be possible in industry, as outside, to pay more attention to prevention and less to treatment.

Medical Care

THE social and economic aspects of medical care are very much under discussion. A national committee concerned with these and related matters points out that medical service of the highest technical quality is frequently ineffective if rendered without regard to social, psychological, and economic factors affecting the patient's condition. As has been so often stressed, good clinical care involves treatment of the patient as a "whole person," as an individual functioning in a definite social environment, rather than as an impersonalized example of an organic pathological disorder. In the modern technical maze the tendency to lose sight of the individual patient is great. Diagnosis and therapy used to be planned in careful relations to all facts relating to the ailing "individual." The argument is advanced by this national committee that a medical care program can promote the principle of family care in community health centers in several ways. Much will be spoken and written in the immediate future about various plans of medical care. Congressional committees have for some time been considering these matters including a broad extension of disability insurance on a federal basis. If any of the legislation already introduced in Congress is enacted, there will, of necessity, be some repercussions in industry. It is therefore recommended that those concerned with health service in industry keep informed on these developments.

Save fingers! *Littell*

AIR-BLAST VALVES

—*they'll* do the job! They automatically eject pieces up to 2 lbs., depending on width of nozzle used and air pressure. They keep hands out of danger zone, as pieces can be fed into press with Littell Vacuum or Mechanical Pickers. Air operates only 1/10th the complete cycle of press—saving air.

Cam is adjustable and fastens to end of crankshaft—timed so that pieces are ejected as freed. Air nozzle is adjustable to any height or position. Littell makes a complete line of press-room equipment, such as Reels, Roll and Dial Feeds, Straighteners, etc.

REQUEST BULLETIN

F. J. LITTELL MACHINE CO.
4107 Ravenswood Ave., CHICAGO 13, ILL.

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ublications of manufacturers are offered by SAFETY ENGINEERING
er Service Department as a convenience to executives. Featured
ogs, data sheets and technical bulletins present the latest information
otective products and equipment.

SHROOM SANITATION

Washing Equipment 1
Washfountain Company.—New 4-page
strates many actual installations of the
ey Duo-Washfountain. The booklet shows
n design of this equipment, the method
control and other interesting features.
in dimensions and diagrams give exact
magazine valve, foot control, easily-
spray head and a self-flushing bowl are
in detail.

EN'S SAFETY EQUIPMENT

s Climbers and Belts 2
Bashlin Co.—Interesting 4-page booklet
the Bashlin Adjustable Climber and its
t parts. Booklet points out that this
er, with a replaceable gaff, is made of
Alloy. It is lighter than conventional
nd has the same strength as equivalent
tailed information is also given for
linemen's belts, safety straps, leather
ol buckets and a complete line of line-
s.

ERS AND SCAFFOLDING

Aluminum Industrial Ladders 3
ity Ladder Corp.—Well illustrated, 18-
alog presents complete line of DUO-
ll-Aluminum, Light Industrial Ladders.
et describes all types of ladders for use
ction, painting, maintenance, window
nd many other industrial operations.
information is given on sectional ex-
ep, platform, folding, marine, mining,
nal ladders, made of wood or light
ther items covered include: Pikepoles,
es, wooden scaffolding, etc. Specifica-
ach ladder are given.

LS AND ACCESSORIES

Pliers with Flexible Jaws 4
I Products Co.—New, 1-page data sheet
the IPCO "New Twist" Pliers. This
ows how the jaw members of the pliers
tantly shifted to various angles within
f 110 degrees. Complete information
n the materials used in this tool and
s methods of operation are described
Specifications, including overall
weight, are given.

Power Driving Tool 5
fety Appliances Co.—How steel studs
ven instantaneously into steel, masonry
e with the M. S. A. Velocity-Power
old in a new 4-page bulletin. Booklet
hod of loading cartridge operating
The spring-loaded safety arm, which
ccidental cartridge discharge, is de-
oroughly. Each part of the driver is
and illustrated in detail. A helpful
the types of studs which should be
ecific jobs.

OOR MAINTENANCE

Abrasive Paint 6
nt & Oil Corp.—New, 4-page bulletin
he three main features of SURE-FOOT
Abrasive Paint in detail. These features
pplication, adaptability and economy.
s show many typical installations in
E-FOOT may be used to control dan-
oping problems of inside and outside
ions.

shing & Maintenance 7
S. Legge Co., Inc.—"Cut Your Job
More Efficient Operating Methods"
of an interesting 2-page reprint re-
cently made available. This article shows how you can save on production costs by using top-grade floor maintenance materials, by showing your maintenance crews how to keep polish on the floors, and avoid slippery floors. Many actual cases are given as illustrations to show that an efficient floor maintenance program can save large amounts of money.

PLANT & BUILDING MAINTENANCE & SANITATION

Sanitary, Fireproof Waste Receptacles 8
The Bennett Mfg. Co.—Well-illustrated, new 8-page booklet describes the complete line of RENNETT BILT Waste Receptacles, with non-rusting, stainless steel feet. Booklet points out that these receptacles are sanitary, easy to use, easy to empty, fireproof, and built to take hard, everyday use. A wide range of sizes, available in either white or green finish, are illustrated. Helpful table of specifications is included.

Plant Sanitation & Maintenance Training 9
Oakite Products, Inc.—The 40th anniversary issue of the Oakite News Service, house organ of Oakite Products, Inc., describes the comprehensive training course which equips plant sanitation and maintenance men for this work. Included are descriptions of the latest technical developments and standard techniques of industrial cleaning and related operations. Booklet shows how these thoroughly trained experts provide industrial plants with a complete technical advisory service.

FLOORING & FLOOR COVERING MATERIALS

Do's and Don'ts of Rubber Mat Care 10
American Floor Products Co.—Extremely useful and informative chart lists the main factors in making rubber mats last longer. The chart tells how to clean mats, and shows the correct way to keep mats in place. The information presented should be helpful not only to new employees but should be of great assistance to all plant maintenance personnel.

AIR CONDITIONING EQUIPMENT

Approved Hazardous Location Heating Units 11
Electromode Corp.—New, 2-page data sheet describes the explosion-proof ELECTROMODE heater for hazardous locations. It is pointed out that this heater is the first all-electric explosion-proof unit to comply with Underwriters' Laboratories specifications for Class I, Group D hazardous location equipment. The heater is designed and approved for use in atmospheres containing gasoline, naphtha, acetone, benzol, lacquer, etc. Bulletin presents schematic diagrams of three basic models of the heater unit. Complete ordering instructions are given.

DUST & FUME CONTROL

Lightweight, Flexible Ventilating Hose 12
American Ventilating Hose Co.—Catalog no. 30, a 16-page booklet, describes the complete line of "FLEXAUST" flexible hose for all industrial uses. Described are: PORTOVENT, a ring-reenforced hose; BLOFLEX, non-reenforced collapsible hose and all types of accessory equipment. Illustrations give many examples of the uses of this flexible hose. Installation data, price list, general information and engineering data are presented in detail.

WASHROOM SANITATION

Question & Answers About Athlete's Foot 13
Onox, Inc.—New, interesting 4-page bulletin presents twenty questions and helpful answers on the subject of athlete's foot and its control. Some of the questions asked include: Why do we have skin trouble on the feet more than elsewhere? Isn't it enough to disinfect the floors? How does ONOX kill the fungus?; Is ONOX economical?; How far will a gallon go?; Does ONOX cure as well as prevent athlete's foot? Bulletin also shows how the ONOX skin toughening method keeps skin tough and resistant to the growth of athlete's foot fungi.

SKIN PROTECTION

Liquid Soap and Soap Dispensing Equipment 14
West Disinfecting Co.—New, well-illustrated, 16-page booklet describes the WEST line of skin soaps and gives much information on the newly-designed, functional soap-dispensing equipment which has been developed by this company. Booklet contains many interesting photographs and schematic drawings, showing typical installations of soap-dispensing equipment in industrial plants, hotels, commercial buildings, stores, etc. Washroom maintenance problems are covered thoroughly.

FIRE EXTINGUISHING EQUIPMENT

Underwriters' Report on Vaporizing Liquid Extinguishers 15
Stop-Fire, Inc.—19-page booklet presents the report on tests made on 1 qt., and 2½ qt. stored pressure vaporizing liquid extinguishers manufactured by this company. Complete construction details are given for each component part of each extinguisher tested. Description of the tests, with results, are given. These include: Design and construction, practicability, fire extinguishment and uniformity. Sectional drawings show the working parts of each extinguishing unit.

New, Lightweight Soda-Acid & Foam Extinguishers 16
Buffalo Fire Appliance Corp.—One-page data sheet introduces the new line of BUFFALO Better-Built fire extinguishers. These new extinguishers, made of stainless steel, are available in both soda-acid and foam types. Bulletin points out that this new line is ½ lighter than older extinguishers; stronger by more than half. It is stated that the BUFFALO Stainless Steel Extinguishers are tested to 500 pounds instead of the customary 350 pounds.

WRITE NUMBERS CORRESPONDING TO THE ITEMS HERE

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SAFETY ENGINEERING
75 Fulton Street
New York 7, N. Y.

August, 1949

NEW PRODUCTS

For illustrated descriptive literature of products listed in this section readers may apply

TO SERVICE DEPT., SAFETY ENGINEERING MAGAZINE

SAFETY POSTER

A NEW idea in plant safety promotion has been developed by Van Houten-Rankins Inc. Colorful safety poster messages are projected in the new Electric Salesman that is now being used effectively in the point of sale merchandising field.

Outstanding features of this service are the way in which posters can be changed and shown through a new type of fluorescent illumination. The display size is 25" x 38". Safety ideas are illustrated and projected within an attractive chromium plated frame work.

It serves as a spectacular for plant entrances, over clocks, and in cafeterias where it can be seen by large groups of employees. Special safety posters are created and produced for the Electric Salesman in close cooperation with industrial safety executives.

This service is being purchased by manufacturers on a basis of twenty-four (24) multi-colored safety posters a year. All sent prepaid to be installed in the Electric Salesman. For further details please send in the coupon.

NYLON CUP GOGGLE

MORE strength and less weight are features of this new welding goggle with cups of DuPont nylon plastic, now being manufactured by Willson Products, Inc., manufacturers of personal safety equipment for industrial use.

Nylon in plastic form has great compressive strength and impact resistance, thus offering extra safety when eye protection is required. It is believed that the more durable nylon cup will last a lifetime on heavy duty jobs even under extreme service conditions.

In addition to light weight, the goggle has other comfort features, including: Rolled edges to reduce pressure around the eye socket, adjustable leather bridge and headband to assure perfect fit, exclusive triangular lenses for extra wide vision, and screened indirect ventilating ports which admit sufficient air to prevent fogging, but keep out dust and flying particles.

The goggle is also available with direct ventilating ports and clear, impact-resisting lenses for shipping and other heavy duty work.

For additional details send in the coupon.

LADDER SHOES

THE Dayton Safety Ladder Shoe has been designed so as to fit any standard ladder. They are easy to install and may be instantly converted to indoor or outdoor use, preventing slipping of the ladder when in use. The shoe or base is made of 16 gauge steel and the side plates of 13 gauge steel. The suction grip treads are renewable. Lock nuts and springs make this versatile shoe fit snugly with no chance of slipping.

Steel teeth grip outdoor surfaces, and the heavy tread keeps the latter in place when used on flooring. For more information use the coupon.

GREASE ABSORBENT

A NEW, entirely different, and highly effective compound for absorbing oil, grease, and other liquids is now being made by the Eagle-Picher Company of Ohio for use on floors of factories, machine shops, and wherever there is danger of slipping.

The product is described as a granular mineral compound, neither clay nor Fuller's earth. It is chemically inert, non-combustible, and insoluble in oil, grease, kerosene, water and other liquids commonly used in industrial operations.

Tests have shown that the Eagle-Picher product will cover and protect an area from 40 to 200 percent greater than the same weight of most other leading products intended for the same purpose.

Eagle-Picher Floor-Dry has the added asset of being light in color so that it brightens the work area, reflecting considerably more light than most competing products even when saturated with oil. When swept up, after absorbing liquids, a smooth dry surface is left.

Use the coupon for detailed information.

SAFE POURING OF ACIDS

A NEW type unbreakable safety container for handling acids is announced by Automotive Rubber Company, Inc. of Michigan.

Equipped with a long 14" spout with curved neck that rests securely on the edge of the tank, the design provides for safe pouring of acids where a reaction is expected.

Like other acids handling utensils in the ARCO line, the new container is constructed of perforated steel with all seams welded. It is completely covered, inside and out and including handles, with $\frac{1}{8}$" tough seamless, semi-hard rubber. The inner and outer coatings are welded through the perforations in the metal to assure permanent adhesion.

At present it is offered as standard in the five gallon size.

EXTRA SIZE GLOVE

THE Pioneer Rubber Company, of Ohio, announces production of a new Stanzoil Industrial Glove, the NL-52 Heavy Duplex. This glove is specifically designed to fill industry's demands for a heavy weight, extra large size, extra length industrial glove with an elastic knit lining.

The new NL-52 is furnished in sizes 10 and 11, is made of elastic, knit-lined neoprene, is 14 inches long. The fingers are straight and coated with the famous Pioneer non-slip finish.

For more information send in the coupon.

TUF-COTE COVER LENSES

A TESTED method which helps to save replacement time and lens spoilage is the use of Tuf-Cote Cover Lenses. Tuf-Cote, which is manufactured by the Wallace Optical Company of Michigan, is applied to the lens as protection against weld spatter and grinding wheel pitting. Tuf-Cote forms a transparent coating over the surface of the lens; and to insure strength, all lenses are given impact tests. Perfected by opticians, this transparent coating does nothing to impair the optic quality of the lens.

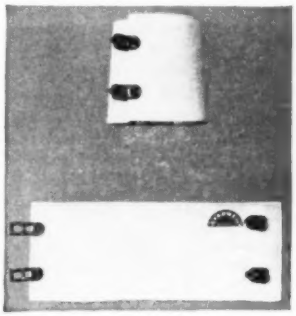
Previously, prescription glasses have had priority on this treatment, but the company has so increased facilities that much wider application is allowed thus making cover lenses available from stock. According to the manufacturer Tuf-Cote Lenses outlast non-treated lenses many times. For further information about these new lenses, please send in the convenient coupon.

SAFETY CARBOY DRAINER

"ACID SPLASH," one of industry's toughest safety problems, may be licked by the new "Wahlert Safety Carboy Drainer." Manufactured by the Wahlert Safety Products Corporation, of New York, it is used in conjunction with the company's Carboy Tilter to make the handling of acids a safe and simple procedure. Scientifically designed, the "Safety Carboy Drainer" pours but does not spill and splash. Uninterrupted liquid flow is guaranteed through an ingenious air vent which makes pumping or syphoning unnecessary. It is practical because every part is replaceable; its soft rubber neck fits different sized carboys; and the vent and spout are made of hard, durable, acid-proof rubber. Three sizes are available. Descriptive literature may be obtained by sending in the coupon.

GARDWELL PANTS GUARD

A NEW pants guard, known as GARDWELL No. 1006-PG Pants Guard is designed for the purpose of protecting machinists and others from injury effected by getting their pants cuff caught in moving machinery or gears. It is especially adaptable for men working in steel mills. It is made from duck material and completely encloses the pants cuff. It extends six inches up on the ankle, and is fitted with two arctic buckles for adjustment, ease in putting on and for quick removal. Made by Safety Clothing and Equipment Co. Send in the coupon.



NEW PAINT DEATH TO INSECTS

AN OUTSTANDING development giving years of effective control of insects, through the incorporation of DDT directly into oil-base paints, is announced by Sonoco Products Company of South Carolina. These products offer definite advantages over present known methods of applying insecticides.

After years of research and field tests, a flat paint and a gloss enamel with superior insecticidal properties are now being added to their regular line of protective coatings.

Sonoco Products Company is the first to successfully develop an enamel type paint which is lethal to flies, mosquitoes, roaches, gnats, etc. A semi-gloss enamel will soon be marketed which, together with the flat and gloss, will give a complete line of interior insecticidal paints, insuring control over all common insect pests for extended periods of time.

Tests have been completed which definitely prove the effectiveness of these paints against insects for more than three years. Thus, users can expect relief from insects for the normal life of the paint.

The manufacturers stress the fact that "our insecticidal paints are formulated for durability, servicability, and ease of application as well as for maximum toxicity to insects. They are of as high quality as any other standard paints on the market."

Please use the coupon.

SKULLGARD EYESHIELD

A SKULLGARD Eyeshield for use with Skullgard protective caps or hats has been announced by Mine Safety Appliances Company. Designed of sturdy, transparent plastic, the new Eyeshield offers positive protection against hazardous flying particles, and assures non-fogging vision and easy wearing comfort over prolonged periods of use.

The new M.S.A. Eyeshield features a hinge-type device which permits quick and dependable attachment to any M.S.A. Skullgard. Three holes are drilled in either the brim or peak of the Skullgard, and rivets, furnished with the shield, secure the hinge support. Keyhole slots in the Eyeshield are then slipped over the stud on each hinge, locking the Eyeshield into position.

When not in use the Eyeshield lies flat against the Skullgard's peak or brim, and is merely flipped downward when needed. Eyeshields may be ordered separately, or attached to M.S.A. Skullgards. For complete details please send in the coupon.

August, 1949

To SAFETY ENGINEERING

75 Fulton St., New York 7, N. Y.

For prices and complete details of items mentioned in this month's "What's New in Safety Products," check items that interest you and mail coupon.

- ☐ Safety Posters
- ☐ Willson Nylon Goggle
- ☐ Dayton Ladder Shoes
- ☐ Floor-Dry
- ☐ Acid Container
- ☐ Extra Size Glove
- ☐ Tuf-Cote Cover Lenses
- ☐ Safety Carboy Drainer
- ☐ Gardwell Pants Guard
- ☐ Insecticidal Paint
- ☐ Skullgard Eyeshield

Firm Name .....

Attention of .....

Position .....

Firm Address .....

City .....

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- SAFETY BELTS
- SKIN PROTECTION
- PRESS GUARDS
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- INDUSTRIAL TRUCKS
- LINEMAN'S SAFETY
- BUILDING MAINTENANCE
- FIRE PREVENTION
- WOMEN'S PROTECTION
- SIGNAL EQUIPMENT
- HYGIENE PRODUCTS
- WOODWORKING SAFETY
- AIR CONDITIONING
- VERMIN CONTROL
- EMERGENCY LIGHTING
- FIRE EXTINGUISHERS
- BODY PROTECTION
- SAFE ACID HANDLING
- EDUCATIONAL AIDS
- ATMOSPHERE ANALYZERS
- EYE PROTECTION
- WASHROOM SANITATION
- DUST CONTROL
- FIRST AID
- ARM & LEG SAFETY
- HEAD PROTECTION
- FIRE CONTROL
- RESPIRATORY PROTECTION
- LIGHTING
- FIRE DETECTION
- SAFE WALKWAYS

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SAFETY DIRECTORY

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PROVED AND APPROVED

New CESCO CUP-TYPE GOGGLES

FEATURING *... The COMFORT-KING Headband—holds goggles firmly with 30% less tension. Made of round molded rubber—will not kink, curl or twist. No buckles or sharp edges. Instant adjustment to any head size.*

CESCO Chippers Goggles • Number 545-C, with brown thermoplastic cups, shown above. **Number 545-T,** with transparent cups, shown below. Both these models are well ventilated, and are equipped with 50 mm Super-Safety Lenses.

CESCO Welders Goggles • Number 545-W, with 50 mm Cescoweld and cover lenses.

Job-Tested and Worker-Endorsed where constant use is required

• CESCO's new development in cup-type goggles increases wearer comfort and assures greater worker safety. These CESCO goggles have the "feel" of lightweight goggles, yet give all the protection good cup-type goggles must provide.

CESCO goggle cups are engineered to fit both left and right eye areas snugly, yet gently. Broad contact surfaces and correct balance eliminate pressure spots. COMFORT-KING Headbands provide the right firmness to hold the goggles comfortably in correct position.

If your workers are not yet wearing the new CESCO Cup-Type Goggles, order them now. Use will prove their advantages to you.

***New* CESCO CATALOG**

Tells you where to use, how to use, and how to select industrial protective equipment. Be sure to have this safety guide. Write for your copy.

CHICAGO EYE SHIELD CO. • 2310 Warren Boulevard • Chicago 12, Illinois

CESCO FOR SAFETY

CESCO

OFFICES IN: Boston, Buffalo, Cincinnati, Cleveland, Columbus, Dallas, Detroit, East Orange, Houston, Los Angeles, Montreal, Philadelphia, Pittsburgh, Seattle, St. Louis, St. Paul, Toledo, Tulsa

For Industrial First Aid

Mercurochrome

Preventing infection is important in reducing lost time due to accidents. Even minor wounds may lead to serious infection and should receive proper first aid treatment.

Mercurochrome* (H. W. & D. Brand of merbromin, dibromoxymercurifluorescein-sodium) is especially suitable for first aid purposes. The 2% aqueous solution is not irritating or toxic in wounds.

Minor injuries are reported promptly when Mercurochrome is the routine antiseptic because treatment is not painful.

Other advantages are that Mercurochrome solutions keep indefinitely and the color shows where it has been applied.

Mercurochrome is accepted by the Council on Pharmacy and Chemistry of the American Medical Association.

* Reg. U. S. Pat. Off.

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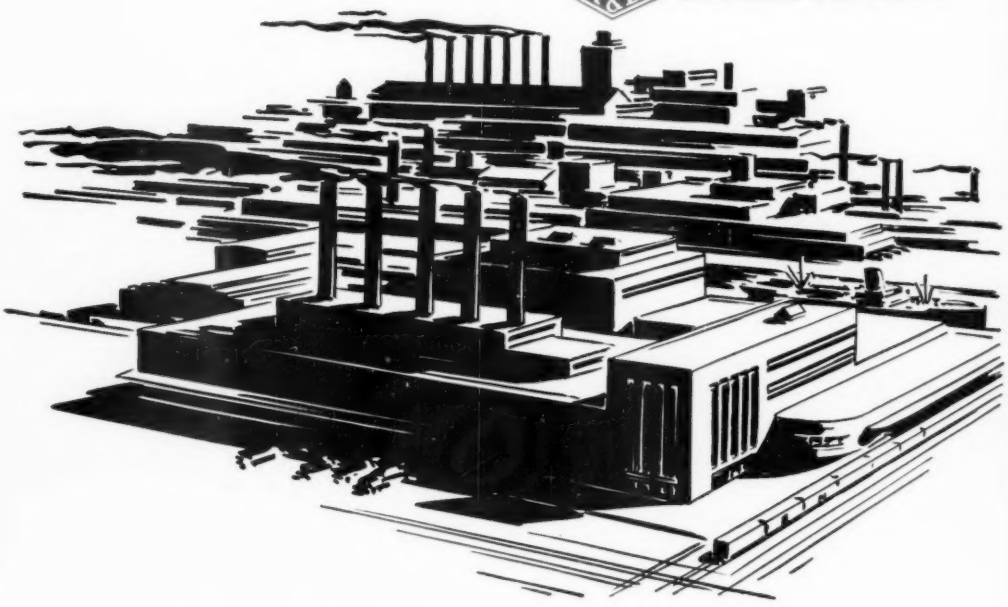
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